Nigerian Electricity Regulatory Commission

Nigerian Electricity Health and Safety Code

NIGERIAN ELECTRICITY HEALTH & SAFETY CODE
Nigerian Electricity Regulatory Commission,
Abuja,
Nigeria.

Approved by:

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Dr. Sam Amadi

Chairman/CEO;

Nigerian Electricity Regulatory Commission (NERC)

Notice

This Code is designed to save lives. The Nigerian Electric Regulatory Commission has stated its intent to enforce the provisions of the Code. This means that the practices defined in this Code are legal obligations. Each employer in the power sector has a legal obligation to ensure that a safe work environment is provided to all employees, both regular and non-regular. Contractors working at distribution stations, transmission stations, power stations or engaging in any work activities involving power generation, transmission, distribution and servicing are also required to follow the best practices and safety standards defined in this Code.

Abstract

This Code covers the basic provisions for safeguarding of persons from hazards arising from the installation, operation, or maintenance of conductors and equipment in electric supply stations, overhead or underground electric supply and communication lines. It also includes work rules for the construction, maintenance, and operation of electric supply and communication lines or equipment. The standard is applicable to the systems and equipment operated by utilities, or similar systems and equipment, of an industrial establishment or complex under the control of qualified persons.

This Code consists of the introduction, definitions, grounding rules, list of referenced and bibliographic documents and parts I, II, III, IV and V. The major referenced documents are the NERC Health and Safety Standards Manuals Volumes and other accepted International Standards.

Foreword by the Chairman/CEO of NERC

Codification Committee Membership

At the time this Code was approved, the Health and Safety Codification Committee had the following membership:

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2	Mr. I. E. Nyong	TCN	Vice Chairman
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21	Idris Idris Aminu	NERC	Member/Secretary
23	Ohaeri Chukwuma	NERC	Member

Letter symbols for units

This Code uses standard symbols for units. They have the following meanings:

A	ampere
C	degree Celsius
ft	foot
ft^2	square foot
ft^3	cubic foot
F	degree Fahrenheit
g	gram
Hz	hertz
h	hour
in	inch
in^2	square inch
k	kilo (10^3)
kg	kilogram
kPa	kilopascal
km^2	square kilometer
kV	kilovolt (1000 volts)
kVA	kilovoltampere
kW	kilowatt
m	meter
m^2	square meter
m^3	cubic meter
m	milli (10^{-3})
mA	milliampere
mi	mile (international)
mm	millimeter
min	minute (time)
N	newton
Pa	pascal
lb	pound
s	second (time)
V	volt
W	watt

Abbreviations

AC: Alternating Current (electricity; physics)
ACGIH: American Conference of Governmental Industrial Hygienists
AED: Automated Eternal Defibrillator
AFFF: Aqueous Film Forming Foam
AFS: American Foundry Society
AIHI: American Industrial Hygiene Association
ANSI: American National Standards Institute
ASTDR: Agency for Toxic Substances and Disease Registry
ASTM: American Society for Testing and Materials
ATB: Anti-Two-Block
AU: Absorption Units
C: Celsius
CaF: Calcium Fluoride
CDC: Center for Disease Control
CERCLA: Comprehensive Environmental Response Compensation and Liability Act
CGA: Compressed Gas Association
CGI: Combustible Gas Indicators
CISD: Critical Incident Stress Debriefing
Cm: Centimeters
CNC: Condensation Nucleus Counter
CO: Carbon monoxide
CO2: Carbon Dioxide
CPR: Cardiopulmonary Resuscitation
CSA: Construction Safety Association
CSHO: Compliance Safety and Health Officer
dB: Decibels
DC: Direct Current (electricity)
DUTs: Devices Under Test
EAR: Expired Air Resuscitation
EHSS: Environmental Health and Safety Services
EHV: Extremely High Voltage
EMS: Emergency Medical Services
EPA: Environmental Protection Agency
EPS: Electric Power Systems
ESCBA: Escape Self-Contained Breathing Apparatus
ESLI: End of Service Life Indicator
FID: Flame Ionization Detector
FMIS: Facilities Management Information System
GFCI: Ground Fault Circuit Interrupter
GHz: Gigahertz (thousands of MHz)
GM: Geiger-Muller
H2S: Hydrogen Sulfide
HASPs: Health and Safety Plans
HAZWOPEP: Hazardous Waste Operations and Emergency Response
HEPA: High Efficiency Particulate Air
Hg: Mercury

HR: Human Resource
HRT: Health Response Team
HSC: Health and Safety Coordinator
HSO: Health and Safety Officer
HV: High Voltage
Hz: Hertz
IDLH: Immediately Dangerous to Life and Health
Kg: Kilograms
kHz: Kilohertz (1000 Hertz)
kPa: Kilo Pascal
LEL: Lower Explosive Limit
LFL: Lower Flammable Limit
LiF: Lithium Fluoride
LMI: Load moment Indicators
m: Meters
MeV: Mega Electron Volt
MHz: Megahertz (million Hertz)
mR/hr: Milliroentgen Per Hour
MRLS: Minimal Risk Levels
MSDS: Material Safety Data Sheets
MUC: Maximum Use Concentration
MW: Molecular Weight
NEPA: National Fire Protection Agency
NERC: North American Electric Liability Corporation
NHCA: National Hearing Conservation Association
NIOSH: National Institute of Occupational Safety and Health
NO: Nitric oxide
NRR: Noise Reduction Rating
NRTL: Nationally Recognized Testing Laboratories
NTOF: National Traumatic Occupational Facilities
O3: Ozone
OH&S: Occupational Health and Safety
OSHA: Office of Safety and Health Administration
Pa: Pascal
PAPR: Powered Air Purifying Respirator
PEL: Permissible Exposure Limits
PID: Photo Ionization Detectors
PM: Particulate Matter
PPE: Personal Protective Equipment
ppm: Parts Per Million
PVC: **P**olyvinyl chloride
QLFT: Qualitative Fit Test
QNFT: Quantitative Fit Test
RCRA: Resource Conservation and Recovery Acts
REL: Recommended Exposure Limits
RF: Radiated Frequency
RFC: Reference Concentration
RFD: Reference Dose
R/hr: Roentgens per Hour

RH:	Relative Humidity
SA:	Spectrum Analyzer
SAR:	Supplied Air Respirator
SARA:	Superfund Amendments and Reauthorization Act
SCBA:	Self-Contained Breathing Apparatus
SHELS:	Significant Human Exposure Levels
SLTC:	Salt Lake Technical Center
SO2:	Sulfur dioxide
SPL:	Sound Pressure Level
STEL:	Short-term Exposure Limits
SVOCs:	Semi-Volatile Organic Compounds
TD:	Thermal Desorption
TICs:	Toxicity Identified Compounds
TLD:	Thermoluminescent dosimeters
TLV:	Threshold Limit Value
TWA:	Time Weighted Average
UEL:	Upper Explosive Limits
U.K.:	United Kingdom
U.S.:	United States
UV:	Ultraviolet
VOCs:	Volatile Organic Compound
VOM:	Colt-Ohm-Milliameter
VSA:	Vector Signal Analyzer
WHO:	World Health Organization

Definitions of special terms

The following definitions are for use with the Nigerian Electricity Health & Safety Code. For other use, and for definitions not contained herein, see *The Authoritative Dictionary of IEEE Standards Terms*.

Administrative authority: The governmental authority exercising jurisdiction over application of this Code which is this case is NERC.

Ampacity: The current-carrying capacity, expressed in amperes, of an electric conductor under stated thermal conditions.

Anchorage: A secure point of attachment to which the fall protection system is connected.

Automatic: Self-acting, operating by its own mechanism when actuated by some impersonal influence—as, for example, a change in current strength; not manual; without personal intervention. Remote control that requires personal intervention is not automatic, but manual.

Bonding: The electrical interconnecting of conductive parts, designed to maintain a common electrical potential.

Cable: A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

Cable jacket: A protective covering over the insulation, core, or sheath of a cable.

Cable sheath: A conductive protective covering applied to cables.

NOTE: A cable sheath may consist of multiple layers, of which one or more is conductive.

Cable terminal: A device that provides insulated egress for the conductors. *Syn:* **termination**.

Circuit: A conductor or system of conductors through which an electric current is intended to flow.

Circuit breaker: A switching device capable of making, carrying, and breaking currents under normal circuit conditions and also making, carrying for a specified time, and breaking currents under specified abnormal conditions such as those of short circuit.

Clearance: The clear distance between two objects measured surface to surface.

Climbing: The vertical movement (ascending and descending) and horizontal movement to access or depart the worksite.

Common use: Simultaneous use by two or more utilities of the same kind.

Conductor:

1. A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.
2. **bundled conductor -** An assembly of two or more conductors used as a single conductor and employing spacers to maintain a predetermined configuration. The individual conductors of this assembly are called *subconductors*.
3. **covered conductor -** A conductor covered with a dielectric having no rated insulating strength or having a rated insulating strength less than the voltage of the circuit in which the conductor is used.
4. **grounded conductor - A** conductor that is intentionally grounded, either solidly or through a non-interrupting current-limiting device.
5. **grounding conductor -** A conductor that is used to connect the equipment or the wiring system with a grounding electrode or electrodes.
6. **insulated conductor -** A conductor covered with a dielectric (other than air) having a rated insulating strength equal to or greater than the voltage of the circuit in which it is used.
7. **lateral conductor -** A wire or cable extending in a general horizontal direction at an angle to the general direction of the line conductors, and entirely supported on one structure.
8. **line conductor -** (Overhead or underground supply lines.) A wire or cable intended to carry electric currents, extending along the route of the line, supported by poles, towers, or other structures, but not including vertical or lateral conductors.
9. **open conductor -** A type of electric supply or communication line construction in which the conductors are bare, covered, or insulated and without grounded shielding, individually supported at the structure either directly or with insulators. *Syn:* **open wire.**

Conductor shielding: An envelope that encloses the conductor of a cable and provides an equipotential surface in contact with the cable insulation.

Conduit: A structure containing one or more ducts.

NOTE: Conduit may be designated as iron-pipe conduit, tile conduit, etc. If it contains only one duct, it is called *single-duct conduit;* if it contains more than one duct, it is called *multiple-duct conduit,* usually with the number of ducts as a prefix, e.g., *two-duct multiple conduit.*

Conduit system: Any combination of duct, conduit, conduits, manholes, handholes, and/or vaults joined to form an integrated whole.

Current-carrying part: A conducting part intended to be connected in an electric circuit to a source of voltage. Non-current-carrying parts are those not intended to be so connected.

De-energized: Disconnected from all sources of electrical supply by open switches, disconnectors, jumpers, taps, or other means.

NOTE: De-energized conductors or equipment could be electrically charged or energized through various means, such as induction from energized circuits, portable generators, lightning, etc.

Designated person: A qualified person designated to perform specific duties under the conditions existing. *Syn:* **designated employee.**

Disconnecting or isolating switch.: A mechanical switching device used for changing the connections in a circuit or for isolating a circuit or equipment from a source of power.

NOTE: It is required to carry normal load current continuously as well as abnormal or short-circuit current for short intervals, as specified. It is also required to open or close circuits either when negligible current is broken or made, or when no significant change in the voltage across the terminals of each of the switch poles occurs.
Syn: **disconnector, isolator.**

Discos: Distribution Companies

Duct: A single enclosed raceway for conductors or cable.

Effectively grounded: Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to limit the build-up of voltages to levels below that which may result in undue hazard to persons or to connected equipment.

Electric supply equipment: Equipment that produces, modifies, regulates, controls, or safeguards a supply of electric energy. *Syn:* **supply equipment.**

Electric supply station: Any building, room, or separate space within which electric supply equipment is located and the interior of which is accessible, as a rule, only to qualified persons. This includes generating stations and substations, including their associated generator, storage battery, transformer, and switchgear rooms or enclosures, but does not include facilities such as pad-mounted equipment and installations manholes and vaults.

1. **Generating station -** A plant wherein electric energy is produced by conversion from some other form of energy (e.g., chemical, nuclear, solar, mechanical, or hydraulic) by means of suitable apparatus. This includes all generating station auxiliaries and other associated equipment required for the operation of the plant.
2. **Substation -** An enclosed assemblage of equipment, e.g., switches, circuit breakers, buses, and transformers, under the control of qualified persons, through which electric energy is passed for the purpose of switching or modifying its characteristics.

Enclosed: Surrounded by case, cage, or fence designed to protect the contained equipment and limit the likelihood, under normal conditions, of dangerous approach or accidental contact by persons or objects.

Energized: Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of earth in the vicinity. *Syn:* **live.**

Equipment: A general term including fittings, devices, appliances, fixtures, apparatus, and similar terms used as part of or in connection with an electric supply or communications system.
Exposed: Not isolated or guarded.

Fall arrest system: The assemblage of equipment, such as a line-worker's body belt, aerial belt, or full body harness in conjunction with a connecting means, with or without an energy absorbing device, and an anchorage to limit the forces a worker can experience during a fall.

Fall prevention system: A system, which may include a positioning device system, intended to prevent a worker from falling from an elevation.

Fall protection program: A program intended to protect workers from injury due to falls from elevations.

Fall protection system (hardware): Consists of either a fall prevention system or a fall arrest system.

Generating station: *See:* **electric supply station.**

Gencos: Generation Companies

Grounded: Connected to or in contact with earth or connected to some extended conductive body that serves instead of the earth.

Grounded effectively: *See:* **effectively grounded**.

Grounded system: A system of conductors in which at least one conductor or point is intentionally grounded, either solidly or through a non-interrupting current-limiting device.

Guarded: Covered, fenced, enclosed, or otherwise protected, by means of suitable covers or casings, barrier rails or screens, mats or platforms, designed to limit the likelihood, under normal conditions, of dangerous approach or accidental contact by persons or objects.

NOTE: Wires that are insulated but not otherwise protected are not normally considered to be guarded. See exceptions under applicable rules.

Hand hole: An access opening, provided in equipment or in a below-the-surface enclosure in connection with underground lines, into which personnel reach but do not enter, for the purpose of installing, operating, or maintaining equipment or cable or both.

Harness: A component with a design of straps that is fastened about the worker in a manner so as to contain the torso and distribute the fall arrest forces over at least the upper thighs, pelvis, chest, and shoulders with means for attaching it to other components and subsystems.

NOTE: Wherever the word *harness* is used in this Code, it refers to full body harness.

In service: Lines and equipment are considered in service when connected to the system and intended to be capable of delivering energy or communication signals, regardless of whether electric loads or signalling apparatus are presently being served from such facilities.

Insulated: Separated from other conducting surfaces by a dielectric (including air space) offering a high resistance to the passage of current.

NOTE: When any object is said to be *insulated,* it is understood to be insulated for the conditions to which it is normally subjected. Otherwise, it is, within the purpose of these rules, uninsulated.

Insulation (as applied to cable): That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

Insulation shielding: An envelope that encloses the insulation of a cable and provides an equipotential surface in contact with the cable insulation.

Insulator: Insulating material in a form designed to support a conductor physically and electrically separate it from another conductor or object.

Isolated: Not readily accessible to persons unless special means for access are used.

Isolator: *See:* **disconnecting or isolating switch.**

Jacket: A protective covering over the insulation, core, or sheath of a cable.

Joint use: Simultaneous use by two or more kinds of utilities.

Lanyard: A flexible line or webbing, rope, wire rope, or strap that generally has a connector at each end for connecting the line-worker's body belt, aerial belt, or full body harness to an energy absorbing device, lifeline, or anchorage.

Limited access highways: As used herein, limited access highways are fully controlled highways where access is controlled by a governmental authority for purposes of improving traffic flow and safety. Fully controlled access highways have no grade crossings and have carefully designed access connections.

Lines:

1. **communication lines -** The conductors and their supporting or containing structures that are used for public or private signal or communications service, and which operate at potentials not exceeding 400 V to ground or 750 V between any two points of the circuit, and the transmitted power of which does not exceed 150 W. When operating at not more than 90 V ac or 150 V dc, no limit is placed on the transmitted power of the system. Under specified conditions, communication cables may include communication circuits exceeding the preceding limitation where such circuits are also used to supply power solely to communications equipment.

   NOTE: Telephone, telegraph, railroad-signal, data, clock, fire, police-alarm, cable-television, and other systems conforming to the above are included. Lines used for signalling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so installed.

2. **electric supply lines -** Those conductors used to transmit electric energy and their necessary supporting or containing structures. Signal lines of more than 400 V are always supply lines within the meaning of the rules, and those of less than 400 V may be considered as supply lines, if so run and operated throughout. *Syn:* **supply lines.**

Line-worker's body belt: A belt that consists of a belt strap and D-rings and which may include a cushion section or a tool saddle.

Live: *See:* **energized.**

Manhole: A subsurface enclosure that personnel may enter used for the purpose of installing, operating, and maintaining submersible equipment and cable.

Manhole cover: A removable lid that closes the opening to a manhole or similar subsurface enclosure.

Manhole grating: A grid that provides ventilation and a protective cover for a manhole opening.

Manual: Capable of being operated by personal intervention.

Minimum approach distance: The closest distance a qualified employee is permitted to approach either an
energized or a grounded object, as applicable for the work method being used.

Multigrounded/multiple grounded system: A system of conductors in which a neutral conductor is intentionally grounded solidly at specified intervals. A multigrounded or multiple grounded system may or may not be effectively grounded. *See:* **effectively grounded.**
Neutral conductor: A system conductor other than a phase conductor that provides a return path for current to the source. Not all systems have a neutral conductor. An example is an ungrounded delta system containing only three energized phase conductors.

Operating Companies:

Out of service: Lines and equipment are considered out of service when disconnected from the system and when not intended to be capable of delivering energy or communications signals.

Overhead ground wire: *See:* **shield wire.**

Overvoltage: Voltage between two points of a system that is greater than the highest value appearing between the same two points under normal service conditions. Overvoltages include, but are not limited to, switching impulse (switching surge) overvoltages and temporary (transient) overvoltages.

Pad-mounted equipment: A general term describing enclosed equipment, the exterior of which enclosure is at ground potential, positioned on a surface-mounted pad.

Positioning device system: A system of equipment or hardware that, when used with its line-worker's body belt or full body harness, allows a worker to be supported on an elevated vertical surface, such as a pole or tower, and work with both hands free.

Positioning strap: A strap with snaphook(s) to connect to the D-rings of a line-worker's body belt or full body harness.

Prestressed-concrete structures: Concrete structures that include metal tendons that are tensioned and anchored either before or after curing of the concrete.

Pulling iron: An anchor secured in the wall, ceiling, or floor of a manhole or vault to attach rigging used to pull cable.

Pulling tension: The longitudinal force exerted on a cable during installation.

Qualified: Having been trained in and having demonstrated adequate knowledge of the installation, construction, or operation of lines and equipment and the hazards involved, including identification of and exposure to electric supply and communication lines and equipment in or near the workplace. An employee who is undergoing on-the-job training and who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training, and who is under the direct supervision of a qualified person, is considered to be a qualified person for the performance of those duties.

Qualified climber: A worker who, by reason of training and experience, understands the methods and has routinely demonstrated proficiency in climbing techniques and familiarity with the hazards associated with climbing.

Raceway: Any channel designed expressly and used solely for holding conductors.
Random separation: Installed with no deliberate separation.

Remotely operable (as applied to equipment): Capable of being operated from a position external to the structure in which it is installed or from a protected position within the structure.

Sag.

1. The distance measured vertically from a conductor to the straight line joining its two points of support. Unless otherwise stated in the rule, the sag referred to is the sag at the midpoint of the span.
2. **initial unloaded sag -** The sag of a conductor prior to the application of any external load.
3. **final sag -** The sag of a conductor under specified conditions of loading and temperature applied, after it has been subjected for an appreciable period to the loading prescribed for the clearance zone in which it is situated, or equivalent loading, and the loading removed. Final sag shall include the effect of inelastic deformation.
4. **final unloaded sag -** The sag of a conductor after it has been subjected for an appreciable period to the loading prescribed for the clearance zone in which it is situated, or equivalent loading, and the loading removed. Final unloaded sag shall include the effect of inelastic deformation.
5. **total sag -** The distance measured vertically from the conductor to the straight line joining its two points of support, under conditions of ice loading equivalent to the total resultant loading for the clearance zone in which it is located.

6. **maximum total sag -** The total sag at the midpoint of the straight line joining the two points of support of the conductor.
7. **apparent sag of a span -** The maximum distance between the wire in a given span and the straight line between the two points of support of the wire, measured perpendicularly from the straight line.
8. **sag of a conductor at any point in a span -** The distance measured vertically from the particular point in the conductor to a straight line between its two points of support.
9. **apparent sag at any point in the span -** The distance, at the particular point in the span, between the wire and the straight line between the two points of support of the wire, measured perpendicularly from the straight line.

Separation: The distance between two objects, measured surface to surface, and usually filled with a solid or liquid material.

Service drop: The overhead conductors between the electric supply line and the building or structure being served.

Service point: The point of connection between the facilities of the serving utility and the premises wiring.

Shield wire (also referred to as overhead ground wire, static wire, or surge-protection wire):A wire or wires, which may or may not be grounded, strung parallel to and above phase conductors to protect the power system from lightning strikes.

Single-grounded system/unigrounded system: A system of conductors in which one conductor is intentionally grounded solidly at a specific location, typically at the source.

Span length: The horizontal distance between two adjacent supporting points of a conductor.

Span wire: An auxiliary suspension wire that serves to support one or more trolley contact conductors or a light fixture and the conductors that connect it to a supply system.

Static wire: *See:* **shield wire.**

Structure conflict: A line so situated with respect to a second line that the overturning of the first line will result in contact between its supporting structures or conductors and the conductors of the second line, assuming that no conductors are broken in either line.

Substation: *See:* **electric supply station.**

Supply equipment: *See:* **electric supply equipment.**

Supply station: *See:* **electric supply station.**

Supporting structure: The main supporting unit (usually a pole or tower) used to support supply and/or communication conductors, cables, and equipment.

1. **readily climbable -** A supporting structure having sufficient handholds or footholds so that the structure can be climbed easily by an average person without using a ladder, tools or devices, or extraordinary physical effort.

2. **not readily climbable -** A supporting structure not meeting the definition of a readily climbable structure, including but not limited to the following:

    a. supporting structures, including poles and tower legs, with handholds or footholds arranged so that there is not less than 2.45 m (8 ft) between either: (1) the lowest handhold or foothold and ground or other accessible surface, or (2) the two lowest handholds or footholds. Diagonal braces on towers are not considered to be handholds or footholds except at their points of attachment.
    b. guy wires

Surge-protection wire: *See:* **shield wire.**

Switch: A device for opening and closing or for changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

Switchboard: A type of switchgear assembly that consists of one or more panels with electric devices mounted thereon, and associated framework.

Tag: Accident prevention tag (DANGER, PEOPLE AT WORK, etc.) of a distinctive appearance used for the purpose of personnel protection to indicate that the operation of the device to which it is attached is restricted.

Termination: *See:* **cable terminal.**

Transferring (as applied to fall protection): The act of moving from one distinct object to another (e.g., between an aerial device and a structure).

Transformer vault: An isolated enclosure either above or below ground with fire-resistant walls, ceiling, and floor, in which transformers and related equipment are installed, and which is not continuously attended during operation. *See also:* **vault.**

Transitioning (as applied to fall protection): The act of moving from one location to another on equipment or a structure.

Ungrounded system: A system of conductors in which no conductor or point is intentionally grounded, either solidly or through a noninterrupting current-limiting device.

Unigrounded system: *See:* **single-grounded system/unigrounded system.**

User(s): As defined in the Grid or Distribution Codes

Unloaded tension:

1. **initial -** The longitudinal tension in a conductor prior to the application of any external load.

2. **final -** The longitudinal tension in a conductor after it has been subjected for an appreciable period to the loading prescribed for the loading district in which it is situated, or equivalent loading, and the loading removed. Final unloaded tension shall include the effect of inelastic deformation (creep).

Utility: An organization responsible for the installation, operation, or maintenance of electric supply or communications systems.

Utility interactive system: An electric power production system that is operating in parallel with and capable of delivering energy to a utility electric supply system.

Utilization equipment: Equipment, devices, and connected wiring that utilize electric energy for mechanical, chemical, heating, lighting, testing, or similar purposes and are not a part of supply equipment, supply lines, or communication lines.

Vault: A structurally solid enclosure, including all sides, top, and bottom, above or below ground where entry is limited to personnel qualified to install, maintain, operate, or inspect the equipment or cable enclosed. The enclosure may have openings for ventilation, personnel access, cable entrance, and other openings required for operation of equipment in the vault.

Voltage:

1. The effective (rms) potential difference between any two conductors or between a conductor and ground. Voltages are expressed in nominal values unless otherwise indicated. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The operating voltage of the system may vary above or below this value.
2. **voltage of circuit not effectively grounded. -** The highest nominal voltage available between any two conductors of the circuit.

   NOTE: If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an autotransformer), both are considered to be of the higher voltage, unless the circuit of the lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction.
3. **voltage of a constant-current circuit -** The highest normal full-load voltage of the circuit.
4. **voltage of an effectively grounded circuit -** The highest nominal voltage available between any conductor of the circuit and ground unless otherwise indicated.
5. **voltage to ground of:**
   - 5.1 **a grounded circuit -** The highest nominal voltage available between any conductor of the circuit and that point or conductor of the circuit that is grounded.
   - 5.2 **an ungrounded circuit.** The highest nominal voltage available between any two conductors of the circuit concerned.

6. voltage to ground of a conductor of:

6.1 **a grounded circuit -** The nominal voltage between such conductor and that point or conductor of the circuit that is grounded.

6.2 **an ungrounded circuit -** The highest nominal voltage between such conductor and any other conductor of the circuit concerned.

Wire gages. Throughout these rules the American Wire Gage (AWG), formerly known as Brown & Sharpe (B&S), is the standard gage for copper, aluminum, and other conductors, excepting only steel conductors, for which the Steel Wire Gage (Stl WG) is used.

Worksite (as applied to fall protection): The location on the structure or equipment where, after the worker has completed the climbing (horizontally and vertically), the worker is in position to perform the assigned work or task.

Introduction to the Nigerian Electricity Health & Safety Code

Purpose

The purpose of this Code is the practical safeguarding of persons during the installation, operation or maintenance of electric supply and associated equipment.

The Code has sets of rules that contain the basic provisions that are considered necessary for the safety of employees and the public under the specified conditions. This Code is not intended as a design specification or as an instruction manual.

Scope

A. This Code covers electricity supply lines, equipment, and associated work practices employed by a public or private electric supply, or in the exercise of its function as a utility. It covers similar systems under the control of qualified persons, such as those associated with an industrial complex or utility interactive system.

B. The NEH&S Code covers utility facilities and functions up to the service point. *NOTE:* The Nigerian Electricity Health & Safety Code covers utilization wiring requirements beyond the service point.

C. NEH&S rules cover street and area lights (supplied by underground or overhead conductors) under the exclusive control of utilities, other bodies and agencies (including their authorized contractors) or other qualified persons (such as those associated with an industrial complex).

D. NEH&S rules do not cover installations in mines, ships, railway rolling equipment, aircraft, or automotive equipment, or utilization wiring.

General rules

A. All electric supply and equipment shall be designed, constructed, operated and maintained to meet the requirements of these rules.

B. The utilities, authorized contractors, or other entities, as applicable, performing design, construction, operation, or maintenance tasks for electric supply lines or equipment covered by this Code shall be responsible for meeting applicable requirements.

C. For all particulars not specified in this Code, construction and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the construction or maintenance of the supply lines and equipment.

Application

A. New installations and extensions:

1. These rules shall apply to all new installations and extensions, except that they may be waived or modified by the Commission. When so waived or modified, safety shall be provided in other ways.

   EXAMPLE: Alternative working methods, such as the use of barricades, guards, or other electrical protective equipment, may be implemented along with appropriate alternative working clearances as a means of providing safety when working near energized conductors.

2. Types of construction and methods of installation other than those specified in the rules may be used experimentally to obtain information, if done where:
   a. Qualified supervision is provided,
   b. Equivalent safety is provided, and
   c. On joint use facilities, all affected parties agree.

B. Existing installations:

1. Where an existing installation meets, or is altered to meet, these rules, such installation is considered to be in compliance with this Code and is not required to comply with any previous edition.

2. Existing installations, including maintenance replacements, that currently comply with prior editions of the Code, need not be modified to comply with these rules except (a) as may be required for safety reasons by the Commission or (b) as required by the existing Nigerian Electricity Health and Safety Standards Manual.

3. Where conductors or equipment are added, altered, or replaced on an existing structure, the structure or the facilities on the structure need not be modified or replaced if the resulting installation will be in compliance with either (a) the rules that were in effect at the time of the original installation, or (b) the rules in effect in a subsequent edition to which the installation has been previously brought into compliance, or (c) the rules of this edition in accordance with the Nigerian Electricity Health and Safety Standards Manual.

C. Inspection and work rules

Inspection rules and work rules in the current edition of the NEH&S Code shall apply to inspection of or work on all new and existing installations.

Waiver

The person responsible for an installation may modify or waive rules in the case of emergency or temporary installations.

A. **Emergency installations**:

1. The clearances required in Part II Section 2.9 may be decreased for emergency installations.
2. Emergency installations shall be removed, replaced, or relocated, as desired, as soon as practical.

B. **Temporary overhead installations**:

When an installation is temporary, or where facilities are temporarily relocated to facilitate other work, the installation shall meet the requirements for non-temporary installation except that the strength of material and construction shall be not less than that required for the required construction.

Intent

A. The word **"shall"** indicates provisions that are mandatory.

B. The word "should" indicates provisions that are normally and generally practical for the specified conditions. However, where the word "should" is used, it is recognized that, in certain instances, additional local conditions not specified herein may make these provisions impractical. When this occurs, the difference in conditions shall be appropriately

C. Exceptions to a rule have the same force and effect required or allowed by the rule to which the exception applies.

D. The word *"RECOMMENDATION"* indicates provisions considered desirable, but that are not intended to be mandatory.

E. The word *"NOTE"* or the word *"EXAMPLE"* used in a rule indicates material provided for information or illustrative purposes only. *"NOTES"* and *"EXAMPLES"* are not mandatory and are not considered to be a part of Code requirements.

F. A *"RECOMMENDATION," "EXCEPTION,"* or *"NOTE"* applies to all text in that rule above its location that is indented to the same level.

Effective date

This Code may be used at any time on or after the Commission's approval date. Additionally, this edition shall become effective no later than 90 days following its approval date for application to new installations and extensions where both design and approval were started after the expiration of that period, unless otherwise stipulated by the Nigerian Electricity Regulatory Commission.

NOTE: A period of 90 days is allowed for utilities and regulatory authorities to acquire copies of the Codes and to change regulations, internal standards, and procedures as may be required. There is neither an intention to require or imply that this Code be implemented before 90 days from the approval date, nor an intention to prohibit earlier implementation.

References:

1. National Electrical Safety Code (NESC); C2 – 2007 Edition
2. The Nigerian Health and Safety Standards Manual (NHSSM)
3. All ANSI, IEEE, IEC, ISO, ASME, ASTM, ASCE, NFPA standards made reference to in this Code or the Nigerian Health and Safety Standards Manual (NHSSM).

CONTENTS

PART I

HOW TO EVALUATE SAFETY PROGRAMS

ARTICLE 1: ELECTRICAL BASED PREMISES

1. INTRODUCTION:

Every Employer is under a duty to provide for its employees:-

i. A safe working environment by having in place a written Health & Safety Policy;
ii. Full and clear information on the hazards associated with every job activity, the technical knowledge and management controls that are in place to eliminate unsafe working conditions;
iii. With knowledge of actions to take in observance of safety rules to eliminate either immediate or long-term risks to their health and well-being.

1.2 SCOPE:

In ensuring a culture of safety, every Employer shall:-

i. Clearly define work standards for each operating facility and ensure that the procedures and policies under Part I Section I (a) to (e) of the Nigerian Electricity Health and Safety Standards Manual are adopted and enforced.
ii. Have a corporate culture that promotes and makes safety of workers and the environment a priority in line with the provisions of Part I Section I (a) to (e) of the Nigerian Electricity Health and Safety Standards Manual.
iii. Carefully assess site-specific work practices and working environments to identify high-risk areas and develop mitigation plans for enhanced occupational and safety performance.
iv. Use employees' documented assessments to prevent potential accidents before they occur and create a safer workplace, work-culture and environment in which employees carry out their work.

1.3 PROCESS:

Every Employer who operates a workplace is required under this code to:-

i. Establish a good house-keeping program, train the employees to have adequate knowledge of effective house-keeping, ensure observance to eliminate hazards and promote good safety practices.

ii. Provide a good housekeeping program that ensures an orderly organization of stored materials and the movement from point of entry to exit; all storage areas shall be clearly marked.

iii. Provide refuse bins at strategic locations and ensure a regular disposal or evacuation of same.

iv. In complying with this section, every employer shall have recourse to the full provisions of Part 1 Section 1 (c) & (d) of the Nigerian Electricity Health and Safety Standards Manual. Furthermore, the Employer shall ensure that:-

   a. Compressed air shall not be used for removing dust, dirt or chips from equipment or work surfaces.
   b. Employees' facilities are adequate, clean and well maintained and lockers are provided for storing employees' personal belongings.
   c. Adequate washroom facilities are provided in line with Part I section I(c)(2)(ii) and Part III Section 3(f)(5-10).
   d. Smoking, eating or drinking in the work area is prohibited except at designated areas.
   e. Trapping chips, shavings and such other materials are cleaned up regularly to prevent accumulation of dirt and entrance ways shall have anti-slip flooring.
   f. Light-colored walls are in place to reflect light and shall avoid dirty or dark-colored walls which absorb light, contrasting colors that caution of physical hazards must be utilized and obstructions such as pillars must be properly marked.
   g. Railings are properly highlighted and no other safety equipment shall be used as substitute for guards. Every employer's housekeeping program shall outline the regulations and standards for colors as stipulated in Part

III Section 3(h) (2-3) of the Nigerian Electricity Health and Safety Standards Manual.

h. Clean light fixtures are provided to improve lighting efficiency.
i. Aisles are sufficiently wide to adequately and safely accommodate people and vehicular/equipment movement where applicable.
j. Steps to prevent spills by regularly cleaning and maintaining machines and equipment. Used absorbents must be disposed of properly and safely.
k. Workers regularly inspect, clean and immediately remove any damaged or worn-out tools from service.
l. A good waste management program for collection, grading and sorting of waste materials for prompt and safe disposal is put in place.
m. All inflammable, combustible, toxic and other hazardous materials are stored in approved containers at designated areas that are appropriate for the different hazards that they pose. Storage of such materials shall be in accordance with the requirements specified in the Fire Codes and other regulations of environmental and occupational health and safety agencies within Nigeria.

1.4 ROLES AND RESPONSIBILITIES

a. Every Employer shall:

i. Establish and maintain a comprehensive occupational safety program, including a written safety policy and an accident investigation program in line with Part I section I(b) of the Nigerian Electricity Health & Safety Standards Manual.
ii. Provide a safe work environment for all Employees, free from any hazard and complying with legal and recommended best practices defined under Part I Section I(b) of the Nigerian Electricity Health & Safety Standards Manual.
iii. Guarantee the health and safety of employees in the workplace and shall prevent work - related injury and disease.
iv. Provide adequate training for employees on best practices to establish and maintain a safe work environment and keep records of such trainings.

v. Provide every employee with the operational information, instructions and trainings they need to do their job safely and employees should be promptly informed of any changes made to it.

vi. Consult with employees (including those with disability) in formulating policies on health and safety and on matters affecting health and safety in the workplace.

vii. Monitor/ inspect its work places regularly, develop action plans to close-out observed findings and keep proper records.

viii. Facilitate wide-spread employee awareness through consultations on workplace safety by mobilizing support persons as well as interpreters for the employees that might need such assistance.

ix. Ensure that Occupational Health and Safety (OH&S) procedures are implemented wherever work is being carried out in accordance with the Nigerian Electricity Health and Safety Standards Manual as the minimum requirements.

x. Ensure that employees are trained on the Health and Safety policy during induction, given relevant training on any new equipment or machinery and employees are provided with regular information and updates on safety training and re-training programs.

xi. Provided adequate training on safety procedures in appropriate formats, including evacuation and general emergencies.

xii. Make available to employees copies of Health & Safety Policy, all other relevant Policies and display NERC Health and Safety Code or Regulations and any other relevant regulations.

b. Both Employers and Employees shall ensure that:

i. Work place practices are safe and not dangerous to human health.

ii. Tools, equipment and machinery are safe and are always kept safe.

iii. When storing, transporting or working with dangerous tools and substances, the best safety practices are fully observed and the health or life of employees' is not put at risk or in danger.

c. The Supervisor shall:

i. Instruct and train new workers on work safety matters, procedures, assign task to them, check their progress and ensure that only adequately trained, qualified and authorized workers operate tools, equipment and use hazardous chemicals.

ii. Ensure that equipment and materials are properly handled, stored and maintained, enforce safety regulations, correct unsafe acts, identify workers with problems such as drugs or alcohol abuse that could affect their performance, follow up with interviews and referrals where necessary and formulate safety rules and inspect hazardous incidences and report promptly.

d. Every employee shall:

i. Know and follow safety and health regulations relating to the job,

ii. Request to be trained before beginning work in a new area where competence is lacking,

iii. Work safely at all times and encourage co-workers to do same

iv. Correct or immediately report any unsafe condition or act to the supervisor; any injury to a First Aid attendant or supervisor;

v. Take initiative to make suggestions for improved safety conditions in the work place and make the work place safe.

1.5 INSTRUCTIONS

a. Site Orientation

Employer shall ensure that:

i. All new employees have a site orientation from their supervisor and are instructed on safety procedures including: the layout of the section, safety orientation, fire exit locations/procedures, emergency equipments and location of First Aid facilities or services.

b. New Employee Orientation:

i. Every employer shall have a Safety Manager, who shall conduct staff training relating to classroom orientation/training, prepare all the training materials (handouts, forms, checklists, lesson plan, etc.), conduct the employee evaluation, and maintain all documentation.

ii. The facility supervisor(s) shall conduct on-the-job training and observation, and determine when the employee is ready for any form of evaluation.

iii. Every employer shall have a Safety Committee which shall assist and support the Safety Manager.

iv. During the orientation period, the Employer shall ensure that new workers are introduced to all the basic safety information that applies to their work areas, such as:

1. General hazards in the work area;
2. Specific hazards involved in each task the employee performs;
3. Hazards associated with other areas of the facility;
4. Company safety policies and work rules;
5. Proper safety practices and procedures to prevent accidents; what to do in case of an accident or injury;
6. The location of emergency equipment such as fire extinguishers, eyewash stations, first-aid supplies, etc.; emergency evacuation procedures and routes;
7. Smoking regulations and designated smoking areas;
8. How to report emergencies, accidents, and near misses;
9. How to select, use, and care for Personal Protective Equipment (PPEs);
10. Effective safe housekeeping rules;
11. Facility security procedures and systems;
12. How to use tools and equipment safely;
13. Publication on Frequently Asked Questions (FAQs) in Health and Safety areas; how to report safety questions and problems ;
14. Safe lifting techniques and materials handling procedures; and
15. Safe methods for handling, using, or storing hazardous materials and the location of material safety data sheets.

v. Every Employer shall ensure that orientation programs are updated and refined by reviewing accident and near-miss reports to reflect early warning signs of new or recurrent hazards in the workplace which must be corrected in order to avoid injury, loss or damage to persons or equipment.

c. Nature of Employee Orientation:

i. Every Employer shall rely on the checklist contained in Part I Section I(d) of the Nigerian Electricity Health & Safety Standards Manual to ensure that all new employees shall receive orientation on safety awareness and information to formal training programs.

d. Workers Rights:

The right to a safe workplace is an inalienable right of every worker and NERC requires employers to provide a safe workplace, free of hazards and ensure strict compliance with the provisions of the Nigerian Health and Safety Standards Manual.

Under this Section, the below listed rights of every worker shall be provided by every Employer to wit:

i. Adequate safety training in accordance with NERC established standards in Part I Section I(e) of the Nigerian Health & Safety Standards Manual.

ii. Third Party Obligations
   a. to comply with all electrical safety instructions given by the person in control of the plants and equipment;
   b. not to willfully interfere with or misuse anything provided for electrical safety at the place;
   c. not to willfully place any person whomsoever at risk of injury or death.

iii. Subject to the above sections every Employee shall have the right of appeal against NERC's Orders or decisions by:
   a. Filing a formal appeal of deadlines for correction of hazards.
   b. Filing an appeal of the deadlines that NERC sets for the Employer to correct any violation in the citation issued to the Employer.
   c. Filing a letter to NERC within 10 working days from the date the Employer posts the notice requesting for an extension of the abatement deadline if the time granted is too short.
   d. Filing a discrimination complaint within 30 days where the employee feels he/she has been unduly punished or discriminated against for exercising his/her health and safety rights or for refusing to work under unsafe conditions posing imminent danger of a serious injury or death, provided also that there was insufficient time to report the matter to NERC for investigation.
   e. Requesting NERC to conduct a health hazard evaluation if the employee is concerned about toxic effects of a hazardous substance in the workplace.
   f. Making an oral or written submission to NERC during the review of this code or the making of any new health and safety standard laws.

1.6 PENALTIES:

Any person who operates or/and manages any electrical based premises in violation of the provision of Part 1 of this code, shall:

a. Upon proof in any court of summary jurisdiction be liable to a fine not exceeding three hundred thousand naira (N300, 000.00) or an imprisonment term of not less than 2 years or both;
b. Any subsequent or continued violation shall attract a fine of not less than five hundred thousand naira (N500, 000.00) or an imprisonment term of not less than 2 years or both;
c. Any further violation may attract the suspension or removal of management or suspension or cancellation of the license of the affected entity.

PART II

SAFETY AND INDUSTRY BEST PRACTICES

ARTICLE 2: AIR QUALITY TESTING AND MONITORING

2.1 INTRODUCTION:

i. Every Employer shall ensure that testing and monitoring of Air quality is strictly carried out where employees may be exposed to:
   - nitrogen dioxide and sulphur dioxide;
   - landfill gases;
   - noxious odours;
   - radon gas;
   - factory emissions;
   - odour complaints;
   - rainwater;
   - metals;
   - smoke levels;
   - dust;
   - volatile organic compounds;
   - indoor air quality (including Carbon Monoxide),
   - And any other harmful substance and shall use the results of the air quality testing to:
   - Assign levels of worker respiratory protection and
   - Prepare emergency response plan.

ii. Every employer shall carry out air monitoring in generator houses, transmitting stations, injection and switching substations, etc. to NERC specifications using recommended methods under Part II Section 2(a) (1-6) of the Nigerian Electricity Health & Safety Standards Manual.

2.2 NOISE TESTING AND MONITORING:

i. Every Employer shall carry out noise survey, generate noise map and issue appropriate Hearing protection gadgets/ Noise Cancelling headsets to all employees, ensure usage, provide adequate information and training
ii. Every electric power producer shall carry out annual audiometric test for all employees
iii. Employees shall not use hearing protection gadgets/ Noise Cancelling headsets as a long term alternative to a proper noise control mechanism by technical and organizational means.
iv. The employer shall effectively apply hearing protection using the following guidelines:
    - make sure the hearing protection give enough protection and aim to get at least below 85 dB at the ear;
    - select hearing protection which are suitable for the working environment - consider how comfortable and hygienic they are;
    - Provide a range of hearing protection so that employees can choose the ones which suit them.
v. For Hearing protection to be used effectively, the employer shall comply with the provision of Part II section 2(b)(1) of the Nigerian Health and Safety Standards Manual.

2.3 OCCUPATIONAL NOISE EXPOSURE STANDARD:

1. Allowable Levels of Exposure:
    a. Protection against the effects of noise exposure shall be provided by the employer whenever the sound levels exceed those shown in the Table below if measured on the A scale of a standard sound level meter at slow response.
    b. When noise levels are determined by octave band analysis, the equivalent A-weighted sound level shall be determined as follows:

Table 1: Permissible Noise Exposures

Duration per day, hours	Sound Level, dBA slow response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

c. When employees are subjected to a sound level exceeding those listed in the Table above, feasible administrative or engineering controls shall be utilized. If such controls fail to reduce sound levels, personal protective equipment (PPE) shall be provided and used to reduce sound levels.

d. The Employer shall establish hearing conservation program in accordance with part II Section 2(b) (3)(ii) of the Health & Safety Standards Manual.

2. Training Programs:

i. Every employer shall institute a training program for all employees that are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such programs.

ii. The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in any protective equipment and work processes.

iii. Every employer shall ensure that each employee is informed of the:

a. effects of noise on hearing;

b. purpose of hearing protectors, the advantages, disadvantages, and attenuation of various types, and instructions on selection, fitting, use, and

c. purpose of audiometric testing, and an explanation of the test procedures.

iv. Every Employer shall make adequate arrangement for a proper recordkeeping in respect of:

I. Employee's exposure measurements described in this section.

II. Audiometric test records described in this section; the record shall include:

a. Name and job classification of the employee;

b. Date of the audiogram;

c. The examiner's name;

d. Date of the last acoustic or exhaustive calibration of the audiometer; and

e. Employee's most recent noise exposure assessment.

III. shall maintain accurate records of the measurements of the background sound pressure levels in audiometric test rooms.

IV. shall retain records for at least the following periods:

- Noise exposure measurement records shall be retained for two years;
- Audiometric test records shall be retained for the duration of the affected employee's employment.

V. All records kept under this section shall be accessed upon request by employees, former employees; representatives designated by individual employees and NERC or appointed representatives of NERC.

VI. Any employer who ceases to do business, shall upon request, transfer to the successor employer all records required to be maintained under this section, and the successor employer shall retain them for the remainder of the period prescribed in this section.

3. Radiation Monitors and Meters:

   Every employer shall provide radiation rate measuring instruments to measure the rate at which exposure is received (more commonly called the radiation intensity). Survey meters, audible alarms and area monitors shall be provided and installed by every employer.

4. Electrical/Electronic Testing Meters:

   i. Every employer shall provide electronic test equipment (called 'testgear') which shall be used to create stimulus signals and capture responses from electronic Devices under Tests (DUTs).

   ii. Every Employer shall provide all basic test equipments described in Part II Section 2(d) (2) (i) to 2(d) (3) of the Health & Safety Standards Manual.

5. Safe Chemical Handling:
    i. Every employer shall observe all the provisions of the Health and safety standards established by NERC to ensure the safety, health and welfare of every person engaged in work or employment of any kind.
    ii. Every employer shall maintain an Material Safety Data Sheet (MSDS) document that contains information on the safe handling procedures and practices for every chemical product.
    iii. Every Employer shall maintain a file of MSDS for all chemicals handled at a site, to train and educate workers on the proper way to handle and use the information in an MSDS, and to make the file available and accessible to all employees within the workplace and NERC at all times.
    iv. Every employer shall for the purpose of transporting chemicals, maintain a list of all regulated hazardous materials to ensure safe handling during transportation in line with International Maritime Organization (IMO), IATA/ICAO regulations and other International Transportation Regulations of which Nigeria is a signatory, as a reference.
    v. Every Employer shall apply procedural recommendations relative to air, land and water as described. During cleanup of spills or leaks, where necessary, the Employer shall use extra Personal Protective Equipment and shall not rely on normal operations.
    vi. Every Employer shall follow the guidelines for disposing of any waste product of any material which is designated as hazardous; it shall be disposed of in a permitted hazardous waste treatment, storage, or disposal facility in accordance with local, state, and federal regulations. Where however the material is non-hazardous, recommendations for disposal shall be made depending on the physical state and known characteristics of the material.

2.4 MAJOR REFERENCES

Every Employer shall provide training and information on some of the major references that have been consulted in preparing the Material Safety Data Sheet (MSDS) and shall be guided by the chemical exposure limits provided in Part II Section 2 (e)(1) to 2(e)(3)of the Nigerian Health & Safety Standards Manual.

2.4.1 Job Hazards Analysis Assessment:

1. A job hazard analysis shall accompany every project work plan. A job hazard analysis shall seek to identify hazards associated with every work, projects and worksites, and identify the proper Protective Equipment needed, modified work procedures and managerial controls.

2. Every Employer, HSE Officers and staff shall use the job hazard analysis to monitor the safety performance of work supervisors, crews or contractors; the analysis shall serve as the standard against which actual safety performance is measured.

3. Any person responsible for preparing project/work plan and any specified HSE Officer shall complete a Job Hazard Analysis Form which shall be approved by a line officer.

4. Toolbox meetings shall be conducted daily prior to the beginning of any task and Supervisors on duty shall comply with every provision of the Job Hazard Analysis and the Form in Part II Section 2 (f)(3)(ii) of the Health & Safety Standards Manual.

5. Every Employer shall have adequate capacity/capability of determining and evaluating the proper hazards assessment program of any particular workplace, site or project and shall ensure that the hazard assessment program contains identification and evaluation of hazards in the workplace, site or project.

6. Every Employer shall use hazard assessment as a performance-oriented provision that enables them to determine the appropriate control measures for identified hazards for the work to be performed.

7. Every Employer shall follow the recommended approach to conduct any hazard assessment in line with the provisions of Part II Section 2 (f)(3) of the Health & Safety Standards Manual.

8. The General Provisions for Performing Safety inspections in every workplace, site and project shall incorporate the standards established under the provisions of Part II Section 2 (f)(3)(iii) of the Nigerian Electricity Health and Safety Standards Manual.

9. Employer's Health, Safety & Environment (HSE) Officer shall be responsible for every facility safety and health inspections and shall ensure that workplace, sites and projects inspections are carried out by persons who have been trained in the Nigerian Electricity Health and Safety Standards Manual, and other Occupational Health & Safety programs.

10. All workplaces and facilities shall be audited annually.

11. All workplaces and facilities shall be inspected at least quarterly and as may be deemed necessary.

12. All Safety inspections shall be conducted in accordance with the provisions of Part II Section 2 (f) (3)(iii) of the Health and Safety Standards Manual

13. All Hazards shall be classified as imminent danger, serious, and non-serious based on the criteria outlined in Part II Section 2 (f) (3) (v) of the Health and Safety Standards Manual.

14. Equipment inspectors shall use appropriate test or sampling equipment when required to evaluate workplace conditions as contained in Part 2Section 2 (f)(3)(vi) of the Health and Safety Standards Manual.

15. The inspection process shall be a closed loop system to ensure correction of hazards as contained in Part II Section 2 (f)(3)(Vii) of the Health and Safety Standards Manual; and every Inspector is required to deliver a closeout presentation and prepare an abatement plan in accordance with the provisions of Part II Section 2 (f)(3)(ix) of the Health and Safety Standards Manual.

16. A general checklist for Hazard Assessment is provided in Part II Section 2 (f) (4) of the Health and Safety Standards Manual.

17. Every Employer shall provide appropriate PPEs and training to the Employee required for the job to be carried out in accordance with the provisions of Part II Section 2 (g) (3) of the Health and Safety Standards Manual.

18. Every Employer shall provide appropriate PPEs and induction for Visitors.

19. Every Employer shall enforce the use of PPEs by employees and third parties within work places, sites and projects.

20. Every Employee shall use the PPEs provided to ensure their safety in accordance with the provisions of Part II Section 2(g) (3) of the Health and Safety Standards Manual.

2.5 FIRST AID AND RESUSCITATION:

a. Every Employer shall provide:
   i. first aid facilities in all workplaces, sites and projects;
   ii. competent and certified First Aider for every workplace, site and project; and
   iii. First Aid training for the workforce, sites and Projects in accordance with the provisions of Part II Section 2 (h)(3) of the Health and Safety Standards Manual.

b. Every Employer shall develop first aid programs and management system in accordance with the provisions of Part II Section 2 (h)(6) to 2(h)(9) of the Health and Safety Standards Manual.

2.6 FIRE PROTECTION, EVACUATION, FIRST RESPONDER AND EMERGENCY PLANNING:

a. Every Employer shall in accordance with the provisions of Part II Section 2 (i) (1-13) of the Health and Safety Standards Manual or NFPA Standards, provide:
   i. Preventive measures for the facilities workplace, sites and projects;
   ii. Adequate fire protective equipment ;
   iii. Emergency evacuation plan for every facility, workplace, site and project;
   iv. A competent and certified emergency response personnel; and
   v. Proper training for the workforce on basic fire fighting and prevention methods/techniques.

2.7 ELECTRIC SHOCK AND LOCKOUT/TAGOUT:

a. Every Employer shall provide adequate training and protection for employees in order to prevent electric shock. Such training program shall be in accordance with the provisions of Part II Section 2 (j)(7)of the Health and Safety Standards Manual.

b. Every Employer shall provide Lockout/Tagout devices and ensure compliance with the procedures in accordance with the provisions of Part II Section 2 (j) (10-12) of the Health and Safety Standards Manual.

2.8 HAND TOOLS, WORKSHOP MACHINES/PRACTICES:

a. Every Employer shall ensure that Employees are trained in the proper use and identification of hazards associated with
    i. all hand tools and
    ii. workshop machines.
b. Every Employer shall ensure full compliance with safe workshop practices and basic safety rules associated with the use of tools, machines and chemicals in accordance with the provisions of Part II Section 2 (k) (1-21) of the Health and Safety Standards Manual.

2.9 LINESMEN GENERAL SAFETY PRACTICES:

a. Every Employer shall provide information and training on various causes of electrical shock such as:
    i. Poor or faulty insulation;
    ii. Improper or inadequate grounding;
    iii. Loose connections;
    iv. Defective or outdated parts;
    v. Ground faults in equipment;
    vi. Unguarded live parts;
    vii. Failure to de-energize electrical equipment when it is being repaired or inspected;
    viii. Intentional use of obviously defective and unsafe tools; or
    ix. Use of tools or equipment too close to energized parts.

b. Every employer shall evaluate the procedures or work practices that shall be carried out to appropriately assess the electrical shock hazard associated with any type of maintenance or repair work.

The following Regulatory requirements shall be strictly observed by both Employers and Employees:

i. All equipment shall be in a de-energized state prior to any maintenance or repair work. (Limited authorized exceptions).
ii. Only a competent and authorized person shall verify and confirm the de-energized state of equipment prior to the commencement of any work.

The following Standard requirements shall be strictly observed by the employers and employees:

i. Every Employer shall ensure that safe work practices are used if circuits, operating at 50 volts or more, are not de-energized (placed in an electrically safe work condition);
ii. Every Employer shall ensure that work practices are targeted at protecting the employee from an arc flash, as well as inadvertent contact with live parts operating at 50 volts or more.
iii. Employees shall perform shock hazard analysis before approaching exposed live parts within the Limited Boundary in accordance with the provisions of table 2.
iv. Every Employer shall ensure that only qualified and competent personnel are permitted within boundary limits as specified in table 2 below

Table 2: Minimum Body Clearance Distance

Operating Voltage (kilovolts)	**Minimum Distance (meters)**
5 to 7.5	0.30
7.5 to 12	0.61
12 to 33	0.91
33 to 66	1.20
66 to 132	1.50
132 and above	2.4 0

2.10 FLASH HAZARD ANALYSIS:

i. Every Employer shall provide information and training on flash hazard analysis and ensure compliance in accordance with the provisions of Part II Section 2 (l) (7) of the Health and Safety Standards Manual.

2.11 BLAST HAZARD ANALYSIS:

i. Every Employer shall provide information and training on blast hazard analysis,

procedures and ensure strict compliance in accordance with the provisions of Part II Section 2 (l) (8) of the Nigerian Electricity Health and Safety Standards Manual.

2.12 SELECTION OF PERSONAL PROTECTIVE EQUIPMENT:

a. Every employer shall:
   i. Assess the workplace to determine if hazards are present, or are likely to be present, requiring the use of PPEs;
   ii. Select, provide and have each employee to use, the type of PPE that is suitable to protect the employee from the hazards identified in the hazard assessment.

b. Every Employee shall be trained to be knowledgeable in the following issues and scenarios:
   i. When PPE is necessary;
   ii. Which PPE is necessary;
   iii. How to properly wear, adjust, and remove PPE;
   iv. The limitations of the PPE; and
   v. The proper care, maintenance, useful life, and disposal of PPE.

2.13 EXTERIOR SAFETY RULES

Every Employer shall provide training and information on the use of Ropes, Body Belts and Safety Straps, Rubber Protective Gloves, Gaffs, Climbers, Live-Line Tools, Vehicles etc in accordance with the provisions of Part II Section 2 (l) (10) (i-vii) of the Nigerian Electricity Health and Safety Standards Manual**.**

2.13.1. Exterior Working Practices

Every employer shall provide training and information on Excavation, Manholes, Potheads, Poles, Climbing in accordance with the provisions of Part II Section 2 (l) (11) (i-v)of the Nigerian Electricity Health and Safety Standards Manual.

2.13.2 Electrical Safety Rules

i. Low Voltage: Every Employer shall ensure that all employees working on low voltage systems comply with the provisions of Part II Section 2 (l) (12) (i) of the Nigerian Electricity Health and Safety Standards Manual.

ii. Medium Voltage: Every Employer shall ensure that all employees working on medium voltage systems comply with the provisions of Part II Section 2 (l) (12) (i) (a) of the Nigerian Electricity Health and Safety Standards Manual.

iii. High Voltage**:** Every Employer shall ensure that all employees working on high voltage systems comply with the provisions of Part II Section 2 (l) (12) (ii) of the Nigerian Electricity Health and Safety Standards Manual.

2.13.3 Circuits

a. De-energized Circuit:

Every Employer shall ensure that employees who work on de-energized (dead) circuits comply with the provisions of Part II Section 2 (l) (12) (iii) (a) of the Nigerian Electricity Health and Safety Standards Manual.

b. Live Circuit:

Every Employer shall ensure that only competent and duly authorized employees shall work on live circuits.

c. Protection:

Every Employer shall ensure that fuses or circuit breakers are installed as overload and short-circuit protection for circuit components and connected loads. Limit their selection with regard to ampere rating to the maximum value allowable for the smallest conductor or equipment used in the circuit.

d. Overload:

Employees shall determine the cause of trouble and a report sent to the appropriate authority after which re-conductoring of the overloaded circuits shall be carried out or dividing the connected load into several circuits.

e. Bypass:

Jumpers shall not be used to bypass the fuse, and circuit-breaker protection shall not be removed from the circuit except when testing for short circuits. These primary safety devices are of vital importance in a circuit installation.

2.13.4 Transformers and Circuit Breakers

Safety precautions shall be observed by the employee when working on transformers, circuit breakers and other switching devices in accordance with the provisions of Part II Section 2(l)(13) of the Nigerian Electricity Health and Safety Standards Manual.

2.13.5 Adequacy and Effectiveness of the Training Program

Every employer shall ensure adequacy and effectiveness of the electrical safe work practices program and training of qualified electrical personnel in accordance with the provisions of Part II Section 2 (l) (15) of the Nigerian Electricity Health and Safety Standards Manual.

2.14 ELECTRICAL SAFE WORK PRACTICES PLAN

Every Employer shall ensure that adequate electrical safe work practices plan is in place in accordance with the provisions of Part II Section2(m)(1-4).of the Nigerian Electricity Health and Safety Standards Manual.

2.15 ELECTRICAL EQUIPMENT

Every employer shall ensure that all individuals are protected from accidental or unexpected activation of electrical and/or mechanical equipment during the maintenance, repairing, cleaning, servicing, and/or adjusting of machinery or equipment.

a. Electrical Safety Facts:

Every Employer shall ensure compliance with the rules and procedures in Part II Section2 (n)(2) of the Nigerian Electricity Health and Safety Standards Manual to reduce electrical hazards in the workplace.

b. Use of Equipment:

The use of Portable equipment shall be in accordance with the provision of Part II Section 2 (n) (4) of the Nigerian Electricity Health and Safety Standards Manual.

c. Vehicular and Mechanical Equipment Safe Clearances:

Minimum clearance of 3.00m shall be maintained for all vehicles or mechanical equipment capable of having parts or its structure elevated near energized overhead lines such as cranes, mobile scaffolds, elevating platforms, dump trucks, lift trucks, flatbed trailer cranes, etc. Clearance is increased by 0.1m for every 10 kV over 50kV if the voltage of the overhead line is more than 50 kV.

2.16 LADDER SAFETY

a. **General Requirements**:

Every employer shall:

i. Provide a ladder at all work points of access if there is a break in elevation of 0.48m or more and no ramp, runway, embankment or personnel hoist is available.
ii. Keep the access point clear of obstacles to permit free passage by workers if there is only one point of access between levels.
iii. Provide a second point of access if free passage becomes restricted.
iv. Ensure that at least one point of access remains clear when there are more than two points of access between levels.
v. Install all ladder fall protection systems required by these rules and ensure that their worksite meets all requirements of the ladder rules before employees use ladders.

b. Rules for All Ladder Types:

The employee shall ensure compliance with the rules as contained in Part II Section 2(o)(2)(i-ii) of the Nigerian Electricity Health and Safety Standards Manual when using all types of ladders.

2.17 FORKLIFT SAFETY

Every Employer shall ensure:

i. that all forklift operators are qualified in accordance with the provisions of Part II Section 2(p)(2) of the Nigerian Electricity Health and Safety Standards Manual.
ii. that employees comply with all the rules and procedures as contained in Part II Section 2 (p) (3-11) of the Nigerian Electricity Health and Safety Standards Manual for the safe operation of all forklifts.

2.18 CRANE OPERATION SAFETY

Operational Considerations:

Every Employer shall ensure that all crane operators and personnel are duly certified in line with the provisions of Part 3 Sections 25, 26 and 27 of the Factories Act of 1987 and in addition shall comply with the provisions of Part II Section 2(q)(2) of the Nigerian Electricity Health and Safety Standards Manual.

2.19 SCAFFOLDS AND OTHER WORK PLATFORMS

Every Employer shall ensure the safe use of Scaffolds and Platforms at work in accordance with the provisions of Part II Section 2(r)(2) of the Nigerian Electricity Health and Safety Standards Manual.

2.20 SAFE WORK PRACTICES NEAR POWER LINES

2.20.1 Safe Work Practices:

Every employer shall ensure that the following safe work practices are observed:

a. Only competent individuals shall trim trees around energized power lines;
b. Ladders and aerial equipment shall not come in contact with electrical equipment;
c. The employee shall maintain the 3.00 meter minimum clearance from power lines. If the line exceeds 11,000 volts, clearance requirements increase; in accordance with table 28 of the Nigerian Electricity Health and Safety Standards Manual
d. These working clearances are minimum safety clearances. Whenever possible, even greater clearances shall be maintained.
e. For work closer than the above clearances, the electric utility shall be promptly notified.
f. No work shall be performed near energized conductors until danger of contact with those conductors has been effectively guarded against. Work site shall be carefully inspected prior to climbing or working on a tree to determine whether electrical lines pass through the tree or within the reach of workers and the immediate public. All lines on utility poles shall be viewed as possibly being energized.
g. Branches hanging on energized power lines shall be removed only by competent tree trimmers in the employ of the electric utility and using approved insulated equipment.

Every employer shall ensure the implementation of additional standards in accordance with the provisions of Part II Section 2 (s) of the Nigerian Electricity Health and Safety Standards Manual.

2.20.2 Procedures to Follow if Contact Occurs

To protect against electric shock injury in the event of contact between a crane and an energized line, the employee shall observe the following:

i. The crane operator shall remain inside the cab.

ii. All other personnel shall keep away from the crane, ropes, and load, as the ground around the machine might be energized.
iii. The crane operator shall remove the crane from contact by moving it in the reverse direction from that which caused the contact.
iv. If the crane cannot be moved away from contact, the operator shall remain inside the cab until the lines have been duly de-energized.

2.20.3 Safe Work Practices

Every Employer shall comply with safe work practices near power lines as provided in Part II Section 2 (s)(3) of the Nigerian Electricity Health and Safety Standards Manual to protect workers, operators of cranes and other boomed vehicles from contacting energized overhead power lines.

2.21 FUNCTIONAL SAFETY FOR ELECTRIC POWER TRANSMISSION

Assuring Functional Safety:

Every Employer shall provide functional safety and security to protect facilities and employees from sabotage such as terrorism, kidnapping, cyber attack, etc.

2.22 EXCAVATIONS AND TRENCHING

Every Employer shall ensure that employees follow the procedures explained on excavation and trenching as contained in Part II Section 2 (u) of the Nigerian Electricity Health and Safety Standards Manual.

2.22.1 Safe Practices on Excavation and Trenching

Every Employer shall ensure that employees follow best practices on excavation and trenching provided in Part II Section 2(u) of the Nigerian Electricity Health and Safety Standards Manual.

2.23 CONFINED SPACES

Every Employer shall identify confined spaces and associated hazards, ensure compliance with entry programs and training provisions as outlined in Part II Section 2 (v) of the Health and Safety Standards Manual.

2.24 COMPRESSED GAS CYLINDER SAFETY

Every Employer shall ensure that the employee identifies, handles, uses and transports compressed gas cylinders in accordance with the provisions of Part II Section 2 (w) of the Nigerian Electricity Health and Safety Standards Manual.

2.25 DRUM HANDLING SAFETY

Every Employer shall ensure that employees are trained in hazard communications and awareness on the safe handling of drums and other hazardous waste containers to prevent accident in accordance with the provisions of Part Ii Section2 (x) of the Nigerian Electricity Health and Safety Standards Manual.

2.26 SAFE WELDING PRACTICES

a. General Provisions:

Welding operations shall be performed by only trained and authorized employees who shall ensure implementation of engineering, administrative and safe work practices, and use of PPE to eliminate the identified hazards.

b. Safe Work Practice:

Every Employer shall comply with safe work practices on welding activities as provided in Part II Section 2 (y)(3-5) of the Nigerian Electricity Health and Safety Standards Manual to protect workers and operators performing welding works.

c. Inspections:

All welding equipment including attachments and accessories shall be inspected on a monthly basis by the supervisor or his designee. A written record including the date, type of equipment, equipment number, and equipment serial number along with the signature of the employee performing the inspection shall be maintained for a period of one year.

2.27 REGULATORY SANCTIONS

Regulatory sanctions shall be imposed on the management of electric facilities upon conviction that continuous violations of any of the provisions of this Health and Safety Code and after exhaustive corrective measures without success; the removal of the management or cancellation of operating license shall be administered by the Nigerian Electricity Regulatory Commission (NERC).

2.28 PENALTIES

A. Electrical Safe Work Practices Plan:

Any Person who operates and / or manages any electrical based premises and fails to provide valid Electrical safe work practices plan as contained in the Commission's Health and Safety Standards Manual Part II section 2, Sub-Section 2 (m) 1-4; 2n (2-5); section 2, (o) sub-section 1-7 (on ladder safety); section 2 (o) sub- section 1-12 (on forklift safety) and section 2 (q) sub section 2q(1-6) on crane operations safety, and evidence of performance and sustenance, shall upon proof be liable to a fine of one hundred thousand naira (N100, 000.00) or imprisonment of one (1) year or to both. Subsequent violation shall attract a fine of not less than two hundred thousand naira (N200, 000.00) or Two (2) year imprisonment or to both. Further violation may attract the suspension of the management or suspension or cancellation of the company's license.

B. Provision of Electrical Safe Work Practices Plan Near Power Lines:

Any person who operates or /and uses any electrical equipment or any equipment capable of conducting electrical energy near power lines, but fails to provide valid and adequate electrical safe work practices as contained in the Commission's Health and Safety Standards Manual Part II Section 2, sub-section 2 (s) (2) i-vii, and evidence of performance shall upon proof be liable to a fine of one hundred thousand naira (N100, 000.00) or imprisonment of six (6) months or to both.

C. Provision of Workshop & Hand Tools Safety Policy:

Any person who operates or/and manages any electrical based premises and fails to provide a workshop machine and hand tools policy which shall contain workshop safety data sheet and workshop and tools safety training plan in accordance with the provision of the Nigerian Electricity Health & Safety code part II section 2 (k), sub –section 2 (k) 1- 22 shall upon proof be liable to a fine of fifty thousand naira (N50, 000.00) or three (3) months imprisonment or both.

D. Provision of Radiation Rate Measuring Instruments:

Any person who operates or /and manages any electrical based premises, and fails to provide radiation rate measuring instruments such as to include survey meters, audible alarms and area monitors as contained in the Commission's Health and Safety Code Part II Section 2

sub-sections 1-10 shall upon proof be liable to a fine of one hundred thousand naira (N100, 000.00) or one (1) year imprisonment or to both.

E. Maintenance of Approved Level of Noise Exposures and Hearing Conservation Programme:

Any person who operates or /and manages any electrical based premises and fails to maintain the approved permissible noise Exposures as contained in table 3 of the commission's health & safety code part 2, section 2 sub-section 3 (i) and without a valid hearing conservation program as contained in same Section 2, sub- section 2b (3) (11) shall upon proof be liable to a fine of One Hundred thousand naira (N100, 000.00) or imprisonment of six (6) months or to both.

F. Provision of a Job Hazard Analysis Assessment & Personal Protective Equipment Program:

Any person who operates or /and manages an electrical based premises and fails to provide a personal protective program which shall contain a job Hazard Analysis Assessment in accordance with the Commission's Health & Safety Code Part II Section 2 sub- section II (f) 1-4 shall upon proof be liable to a fine of fifty thousand naira (N50,000.00) or three (3) months imprisonment or to both.

G. Provision of Linesmen Safety Practice Rules:

Any person who operates or/ and manages any electrical based premises that engages the services of linesmen and fails to provide a set of rules on linesmen safety practice and evidence of performance and sustenance in accordance with the provisions of the Commission's Health & Safety Code Section II, sub-section 2 (1) 1-16 and sub section 2n 1-6 shall upon proof be liable to a fine of One hundred thousand naira (N100, 000.00) or six (6) months imprisonment or to both.

H. Provision of Functional Safety Programme For Electric Power Transmission System:

Any person who operates or/and manages any Electric Power Transmission System and fails to provide a valid functional safety programme comprising of Facility Hazard Analysis and Job Safety Analysis Programs with documentary evidences of performance and sustenance in accordance with the Commission's Health & Safety Code section 2 (t) sub-sections 1-4

shall upon proof be liable to a fine of one hundred thousand naira (N100, 000.00) or one (1) year imprisonment or to both.

I. Provision of Excavation &Trenching Safety Practices & Program:

Any person who carries out or /and manages Excavation and /or Trenching in any electrical based work related places and fails to provide valid Excavation & Trenching Safety Practice Program and evidences of performance and sustenance in accordance with the Commission's Health & Safety Code Section 2 (II) sub-sections 1-4 and section 5 (i-vi) shall upon proof be liable to a fine of one hundred thousand naira (N100, 000.00) or one (1) year imprisonment or to both.

J. Provision of Electrical Safe Work Practices Plan Near Power Lines:

Any person who operates or /and uses any electrical equipment or any equipment capable of conducting electrical energy near power lines, but fails to provide valid and adequate electrical safe work practices as contained in the safety rules and regulation in accordance with the commission's health and safety code part II section 2, sub-section 2 (s) (2) i-vii, and evidence of performance shall upon proof be liable to a fine of one hundred thousand naira (N100,000.00) or imprisonment of six (6) months or to both.

PART III

WORKERS' SAFETY RULES

3.1 CRITICAL INCIDENT STRESS

3.1.1 Responding to Emergency Events:

Every Employer shall employ competent persons to effectively respond to crisis within the facilities in such a manner as to ensure the safety of personnel and property in accordance with the provisions of Part III Section 3(a-l) of the Nigerian Electricity Health and Safety Standards Manual.

Every Employer shall ensure training on toxic chemical handling and stress management for its employees in accordance with the provisions of Part 3 Section 3(b) of the Nigerian Electricity Health and Safety Standards Manual.

3.1.2 Electrical Protective Devices:

All electrical protective devices shall comply with the design requirements, standards markings, AC/DC proof test requirements, and ASTMD standards as provided in Part III Section 3(c)(1-5) of the Nigerian Electricity Health and Safety Standards Manual.

Every Employer shall ensure that hazard assessments are conducted and Personal Protective Equipment are provided in compliance with standards test and maintenance programs provided in Part 3 Section 3(e)(1-5) of the Nigerian Electricity Health and Safety Standards Manual.

Every Employer shall ensure adequate sanitation of the work place in accordance with the provisions of Part III Section 3(f)(1-14) of the Nigerian Electricity Health and Safety Standards Manual.

3.1.3 Safety Color Code, Signs and Tags for Marking Physical Hazards:

Every Employer shall comply with the requirements for Color Codes, Signs and Tags for marking physical hazards as provided in Part III Section 3(g) -3(h)(5) of the Nigerian Electricity Health and Safety Standards Manual.

3.1.3 Permits for Confined Spaces:

Every Employer shall comply with the provisions of Part III Section 3 (i)(1-4) of the Nigerian Electricity Health and Safety Standards Manual.

3.1.4 Training and Communication:

Every employer shall provide adequate training to ensure that the purpose and function of the energy control program are clearly understood by employees and that the knowledge and skills required for the safe application, usage, and removal of the energy controls are acquired by employees in accordance with the provisions of Part III Section 3 (j) (8) of the Nigerian Electricity Health and Safety Standards Manual.

3.1.5 Medical Services:

Every employer shall ensure the availability of medical services and competent personnel for advice, consultation and treatment of employees.

In the absence of an infirmary, clinic, or hospital in close proximity to the workplace a person or persons shall be adequately equipped to render first aid within the work area. Adequate first aid supplies shall be readily available.

3.2 PENALTIES

A. Provision of First-Aid & Resuscitation Program:

Any person who operates or/and manages an electrical based premises without provision of a First Aid resuscitation program with all essential components of the First Aid Training Plan and First Aid Suppliers Plan in accordance with the Nigerian Electricity Health & Safety Code Section III 3 (1c) shall be guilty of an offence and shall be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or three (3) months imprisonment or both.

B. Provision of Hot Work Program, Element & Elements of Safe Welding Practices:

Any person who operates or/manages any electrical based premises without provision of hot work program and elements of safe welding practices especially covering training and work performed by authorized personnel requirements as contained in the Nigerian Electricity Health and Safety Code of in Part III section 2 (y) (1) to 2(y) (5) shall be guilty of an offence and shall be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or six (6) months imprisonment or both.

C. Provision of Adequate Slings Safety Program & Inspection Records:

Any person who operates and/or manages an electrical based premises without provision for adequate sling safety program and inspection records to slings as used in conjunction with

other handling equipment for movement of materials for hoisting as contained in the Nigerian Electricity Health and Safety Code Part III section (o) shall be guilty of an offence and shall be liable to a fine of Fifty Thousand Naira (N50, 000.00) or three (3) months imprisonment or both.

D. Control of Hazardous Energy (Lockout /Tag Out):

Any person who operates and/or manages any electric based premises but fails to meet the requirements of the Lock Out/ Tag Out program and its implementation) as contained in the Nigerian Electricity Health and Safety Code Part III Section 3; shall upon proof be liable to a fine of Two Hundred and Fifty Thousand Naira (N250, 000.00) or six (6) months imprisonment or both.

E. Provision of Adequate Safety Colour Code Marking For Physical Hazards & Accident Prevention Signs & Tags:

Any person who operates and /or manages any electrical based premises but fails to provide adequate safety color code marking for physical hazards, and meet specifications for accident prevention signs and tags as contained in the Nigerian Electricity Health & Safety Code Part III 3(g), 3h (i) to 3 (h) 5 shall upon proof be liable to a fine of Fifty Thousand Naira (N50, 000.00) or three (3) months imprisonment or both.

F. Meeting Sanitation Requirements:

Any person who operates and/or manages any electrical based premises but fails to meet sanitation requirements as contained in the Nigerian Electricity Health and Safety Code Part III sub- section 3 (f) (if) – (1) shall upon proof be liable to a fine of Fifty Thousand Naira (N50,000.00) or three (3) months imprisonment or both.

G. Provision of Material Safety Data Sheet, List & History or Properties of Toxic Industrial Chemicals:

Any person who operates or/and manages any electrical based premises and fails to provide the following under listed as contained in the Nigerian Electricity Health & Safety Code Part III Section 3b

- List of chemicals on the premises
- Properties of the chemicals
- Materials Safety Data Sheet (MSDS) of each Chemical

- Evidence of Hazard communication to users
- Evidence of adequate Personal Protective Equipment for use in the area
- Evidence of good storage area and containment

Shall upon proof be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or six (6) months imprisonment or both.

H. Provision of Adequate Emergency Response & Contingency Plans:

Any person who operates or/and manages any electrical based premises but fails to put in place adequate emergency response and contingency plans as contained in the Nigerian Electricity Health and Safety Code Part III Section (3)1) (i) to 3 (a) (3) shall upon proof be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or six (6) months imprisonments or both.

I. Provision Of Adequate Electrical Protective Devices:

Any person who operates or/and manages any electrical based premises but fails to provide adequate electrical protective devices in line with the requirements as contained in the Nigerian Electricity Health & safety code part III sub- section 3(c) (i) to 3 (c) 5; part 2 section 2 sub section 2 (d) 1-3 shall upon proof be liable to a fine of Fifty Thousand Naira (N50, 000.00) or three (3) months imprisonment or both.

J. Provision of Adequate Protective Grounding Programme:

Any person who operates and/or manages any electrical based premises but fails to provide adequate protective grounding program which include the temporary and permanent groundings with evidence of implementation, as contained in the Nigerian Electricity Health & Safety Code, Part III Annex C shall upon proof be liable to a fine of Two Hundred Thousand Naira (N200, 000.00) or 6 months imprisonment or to both.

K. Provision of Training Contents of the Code (General):

Any person who manages and/or operates electrical based premises but fails to provide adequate training for its employees in accordance with all the sections of the commission's health and safety code shall upon proof be liable to a fine of Two Hundred and Fifty Thousand Naira (N250, 000.00) or an imprisonment of six month (6) months or both.

PART IV

RECORDKEEPING, TRAINING AND INSPECTIONS

ARTICLE 4: ACCIDENT INVESTIGATION AND REPORTING

4.1 SAFETY RECORDKEEPING PRACTICES:

Every employer shall keep record of all occupational injuries and illnesses in the "Injuries and Illnesses Incident Report Form" and "Log of Work-Related Injuries and Illnesses Form" as contained in Part IV Section 4(c) of the Nigerian Electricity Health and Safety Standards Manual. A **"Summary of Work-Related Injuries and Illnesses Form"** shall be completed, filed and posted by the employer every 31st of January following the year covered by the Form. Records shall be kept for a minimum of ten (10) years.

4.1.1 Illnesses:

Every Employer shall:

i. Document any work-related recordable illness that is "diagnosed or recognized" in accordance with provisions of Part IV Section 4(b)(1) of the Nigerian Electricity Health and Safety Standards Manual
ii. Employ the services of a competent physician, registered nurse or someone with training and experience to make a diagnosis, treat and also keep proper records.

Any condition that is caused by anything other than an instantaneous event shall be recorded as an illness.

4.1.2 Injuries:

Every employer shall ensure that injury which involves any of the following but not limited to shall be recorded:

i. medical treatment (other than first aid);
ii. loss of consciousness;
iii. restriction of work motion;
iv. transfer to another job;
v. termination of employment;
vi. electrical burns;
vii. Electrocution, etc.

4.1.3 Deaths:

Every Employer shall ensure that any death of an employee or former employee that occurs as a result of a work related injury or illness that is recordable is recorded. If an employee has a work related recordable injury or illness and then is terminated or retires, and then dies as a result of the recordable injury or illness, the death shall also be recorded.

4.2 DIVULGEMENT OF RECORDS OF INJURY AND ILLNESS

Every employer shall provide Records of Injuries and illnesses to any authorized person or body on demand for examination and any analysis deem fit in accordance with the provisions of Part IV Section 4(b)(6) of the Health and Safety Standards Manual.

4.2.1 Accident Recordkeeping Forms:

Every employer shall comply with the use of the prescribed accident record keeping forms provided in Part IV Section 4 (c) of the Health and Safety Standards Manual.

4.2.2 Accident Investigation:

Every employer shall comply with accident investigation provisions of Annex A of the Health and Safety Standards Manual

4.2.3 Incident Reporting Procedure:

All reportable incidents occurring in the lines and Equipment of 11 kV and above at the 33 kV substations shall be promptly reported orally by the Disco whose Equipment has experienced the incident, to Users identified by the Disco and to the System Operator within one hour. The reporting Disco should submit a written report to the NERC within 24 hours of such oral report, if necessary such report should be sent to affected Users. If the reporting incident is of major nature, the written report shall be submitted within two hours duly followed by a comprehensive report within 48 hours of the submission of the initial written report. In other cases, the reporting Disco shall submit a report within five working days to NERC, where the incident impacts negatively on Transmission network the Transmission Company should be duly informed as above.

The NERC shall call for a report from any Disco on any reportable incident affecting other Users and in case of such User who's Equipment might have been a source of the reportable incident does not report same. However this shall not relieve any User from the obligation to

report Events in accordance with Incident Reporting Rules agreed with the Disco. The format for such a report shall typically contain the following:

- Location of the incident
- Date and time of the incident
- Plant or Equipment involved
- Ownership of the faulted Plant or Equipment
- Supplies/generation interrupted and the duration wherever applicable,
- Amount of Generation lost, wherever applicable,
- System Parameters before and after the incident: Voltage, Frequency, Load, Generation, etc.
- Network configuration before the incident,
- Relay indications and performance of protection,
- Brief description of the incident, Estimated Demand shed Automatic/Manual
- Estimated time of return to service,
- Any other relevant information,
- Recommendations for future improvement,
- Name and designation of the reporting person.

The report shall contain sufficient detail information to describe the Event to enable the recipient assess the implications and risks arising out of the same. The recipient may ask for clarifications wherever necessary and it is obligatory that the reporting User shall put in his best efforts and provide all the necessary and reasonable information.

In case of a request by either party, the oral report shall be written down by the sender and dictated by way of a telephone message or sent by Fax/e-mail to the recipient. In case of an emergency the report can be given only orally and followed by written confirmation.

Reporting of accidents shall be in accordance with the Incident Reporting Rules. If an accident occurs in the Distribution System resulting in or likely to have resulted in loss or injury to human or animal life, the Disco shall send a report to the Nigerian Electricity Regulatory Commission within 24 hours of the knowledge of such occurrence. This shall be followed by a written report in the form set out in the Incident Reporting Rules on the aspect of occurrence of fatal and all other accidents.

4.2.4 Joint Investigation of Significant Incidents:

Where a Significant Incident has been declared and a report submitted under 5.11 and 5.12 either party or parties may request in writing that a joint investigation be carried out.

The composition of such an investigation panel will be appropriate to the incident to be investigated, and agreed by all parties involved.

Where there has been a series of Significant Incidents (that is to say, where a Significant Incident has caused or exacerbated another Significant Incident) the parties involved may agree that the joint investigation should include some or all of those Significant Incidents.

A joint investigation will only take place where all affected parties agree to it. The form and rules of the procedure for, and all matters (including, if thought appropriate, provisions for costs and for a party to withdraw from the joint investigations once it has begun) relating to the joint investigation will be agreed as the time of a joint investigation and in the absence of agreement the joint investigation will not take place.

Any joint investigation under this section of the code is separate from any inquiry which may be carried out under the Electricity Power Sector Reform Act of 2005 (as amended from time to time) or other Industry Rules and Regulations.

4.3 SAFETY TRAINING AND RECORDKEEPING

4.3.1 Type of Training:

In addition to the safety training programs provided for in Part I, II, III of the Nigerian Electricity Health and Safety Code, every employer shall develop and implement such other safety training programs in accordance with the provisions of Part IV Section 4 (d) of the Nigerian Electricity Health & Safety Manual.

4.3.2 Recordkeeping:

Every Employer shall maintain training records of all employees from the date of first employment and up to five years after retirement or termination. The records shall include name of employee, type of training session, dates of training and number of contact hours.

Every Employer shall make the records available to NERC inspectors or any authorized person upon request.

4.4 OCCUPATIONAL HEALTH AND SAFETY OFFICE

Every employer shall establish and maintain a functional Occupational Health & Safety Office which shall be overseen by competent personnel that report directly to the Head of the organization.

1.5 PENALTIES

A. Provision of Adequate Safety Record Log:

Any person who operates or/and manages any electrical based premises and fails to provide adequate safety records of occupational injuries, illnesses as well as deaths in accordance with the Nigerian Electricity health and safety code shall upon proof be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or six (6) months imprisonment or both.

B. Falsification of Any Record of Health & Safety Matters:

Any person who operates or/and manages any electrical based premises and found involved in falsification of any record in respect to health and safety matters as contained in the Nigerian Electricity Health & Safety Code Part IV Section 4 sub section a –c or/and any related section therein found in the code shall upon proof be liable to a fine of Two Hundred and Fifty Thousand Naira (N250, 000.00) or imprisonment term of six (6) months or both.

C. Provision of Training Contents of the Code

Any person who manages and/or operates electrical based premises but fails to provide adequate training for its employees in accordance with all relevant sections of the Nigerian Electricity health and safety code shall upon proof be liable to a fine of Two Hundred and Fifty Thousand Naira (N250, 000.00) or an imprisonment of twelve (12) months or both.

PART V

RISK AND VULNERABILITY ASSESSMENTS

ARTICLE 5: RISK MANAGEMENT

5.1 RISK MANAGEMENT

5.1.1 General:

Every employer shall have a functional risk management process in place in accordance with the provisions of Part V Section 5(a)(1) of the Nigerian Electricity Health and Safety Manual.

5.1.2 Health and Safety Management Committees:

Every Employer shall establish a Health and Safety Management Committee to provide valuable services to the organization for risk and other safety management planning. The Committee shall meet periodically to exchange risk and other safety management ideas and information.

The Committee shall comprise of the following:

i.	Head of the Company	-	Chairman
ii.	Head Technical/Maintenance	-	Member
iii.	Head Operations/Dispatch	-	Member
iv.	Head Procurement	-	Member
v.	Head Accounts	-	Member
vi.	Head Human Resources	-	Member
vii.	A representative of Labour Unions	-	Member
viii.	Head of Medical Services	-	Member
ix.	Head Health & Safety	-	Member/Secretary

The Committee shall have oversight responsibility for implementing the Company's Health and Safety Policy and the Health and Safety Code.

In ensuring compliance with the provisions of this Code, the Committee shall be guided by the provisions of Part V Section 5 (a)(3) of the Health and Safety Standards Manual.

Every employer shall ensure compliance with the crisis management and vulnerability assessment procedures in accordance with the provisions of Part V Section 5 (c) of the Nigerian Electricity Health and Safety Standards Manual.

5.2 INSURANCE

Every employer shall take a comprehensive insurance policy to adequately cover its facilities, employees and third parties as appropriate without prejudice to other national laws on insurance.

5.3 REPORTING OBLIGATIONS

5.3.1 Reporting of Significant Incident and Accident:

Every case where either or combination of the following happens:

- malfunctioning of Equipment, Apparatus within the Company;
- a person, or animal receives an electric shock, whether mild or serious or suffers an injury or burn, directly or indirectly due to electrical causes.

shall be treated as a Significant Incident. Every employee in charge of the concerned Equipment, Apparatus or area shall report the incident to the employer within 24 hours. The Safety Manager of the Company or his designated nominee shall reach the spot within 48 hours and assess the situation and probable cause of the accident, losses, and damage to Equipment, Apparatus of the Company and or the User(s).

In the event of an accident resulting in or likely to result in loss of life or injury to human beings or animals, the Company Safety Manager shall prepare a preliminary report within 72 hours. The Company shall take all other statutorily required actions, such as reporting to the Nigerian Police, etc.

The Company shall send a preliminary report to the Commission (NERC) of all Significant Incidents in its area of operation which result in substantial damage to equipment, loss of life, injury to human beings and or animals within 72 hours of its occurrence followed by a detailed report within four (4) weeks

For every Significant Incident, the Commission shall order an in-depth inquiry of the event within twenty days (20).

5.4 PENALTIES

A. Provision of Adequate Risk, Crisis & Vulnerability Assessment Programs:

Any person who operates and/or manages any electrical based premises but fails to provide adequate evidence of risk, crisis and vulnerability assessment programs and management in accordance with the Nigerian Electricity Health and Safety Code Part V Section 5 (a) to 5 (c) shall upon proof be liable to a fine of Fifty Thousand Naira (N50,000.00) or three (3) months imprisonment or both.

B. **Provision of Training Contents of the Code**:

Any person who manages and/or operates electrical-based premises but fails to provide adequate training for its employees in accordance with all the sections of the Nigerian Electricity health and safety code shall upon proof be liable to a fine of Two Hundred and Fifty Thousand Naira (N250, 000.00) or an imprisonment of twelve (12) months or both.

C. Reporting Obligation:

Any person who manages and/or operates electrical-based premises but fails to comply with all reporting compliance obligation in accordance with Part V Section of the Nigerian Electricity Health and Safety Code shall upon proof be liable to a fine of One Hundred Thousand Naira (N100, 000.00) or imprisonment of three (3) months or both.

PART VI

REVIEW PROCESS AND CODE DISPUTES

6.1. THE NIGERIAN ELECTRICITY HEALTH AND SAFETYCODE REVIEW PANEL

6.1.1. The Operating Companies shall establish and maintain a Health and Safety Code Review Panel ("the Panel") under the administration of the Nigerian Electricity Regulatory Commission (NERC). The Panel shall be responsible for improving and developing the Code through regular review, consultation, research and other methodologies found appropriate from time to time. The funding and maintenance of the Panel shall be the responsibility of the Operating Companies or **through their appointed agent**. The secretariat of the Panel shall be located in a place agreed to by a majority of the Operating Companies.

6.1.2. The Panel shall be a standing body to carry out the functions referred to in paragraph 6.1.3.

6.1.3. The Health and Safety Code Review Panel shall:

a. Maintain and ensure publication of the current version of the **Nigerian Electricity Health and Safety Code;**

b. Keep the Health and Safety Code and its implementation under review;

c. Review all suggestions for amendments to the Health and Safety Code which NERC or any User or Operating Companies may wish to submit for consideration by the Panel from time to time;

d. Publish recommendations as to amendments to the Health and Safety Code that any of the Operating Companies or the Panel feels are necessary or desirable and give reasons for the recommendations;

e. Submit to the Commission recommendations to each proposal for amendment to the **Health and Safety Code** and the reasons for the recommendations;

f. Issue guidance in relation to the Health and Safety Code and its implementation, performance and interpretation when asked to do so by any User;

g. Consider what changes are necessary to the Health and Safety Code arising out of any unforeseen circumstance referred to it by Users of the Generation, Transmission, Distribution Networks, Generation, Transmission, Distribution Companies or NERC;

h. Consider and identify changes to the Health and Safety Code to remove unnecessary section(s) or clause(s) that are irrelevant to the effective operation of the Nigeria Electricity Supply Networks;
i. Establish and maintain joint coordination arrangements with the Grid Code and Distribution Code Review Panels to coordinate changes for consistency.

6.1.4. The Panel shall consist of:

a. A Chairman and up to 8 members jointly appointed by the Operating Companies;
b. 2 persons representing Generating Companies one of which must represent hydro power stations;
c. 2 persons representing TCN (one from the TSP and other from the System Operator);
d. 2 persons representing Distribution Companies;
e. 2 persons representing the Independent Power Producers;
f. 3 persons representing Consumers in the following categories - domestic, commercial and industrial;
g. A person appointed by the Nigerian Electricity Regulatory Commission;
h. The Chairman of the Panel shall be elected by the members of the Panel.

Each of the Panel members shall be appointed by their respective industry-sector pursuant to the rules issued by the Panel in **6.1.5**.

6.1.5. The Panel shall establish and comply at all times with its own rules and procedures relating to the conduct of its business, which shall be approved by NERC. Meetings of the Panel shall be held at regular intervals and at least **once every quarter except for emergencies** at such **time** and place as the Panel shall decide.

6.2. HEALTH AND SAFETY CODE AMENDMENTS

6.2.1. All amendments to the Health and Safety Code must be first reviewed by the Health and Safety Code Review Panel prior to submission to the Commission for approval. All proposed revisions from Users, the Commission, a Disco, Genco or the System Operator shall be sent to the Chairman of the Health and Safety Code Review Panel for consideration by the Panel. The Chairman will advise the Panel of all proposed revisions to the Health and Safety Code with notice of no less than [20 Business Days] in advance of the next scheduled meeting of the Health and Safety Code Review Panel.

6.2.2. The Panel shall consult in writing all Industry Stakeholders and Operators which are liable to be affected in relation to all proposed amendments to the Health and Safety Code and shall review and discuss all proposed amendments and comments to the Health and Safety Code prior to coming up with recommendations to amending the Health and Safety Code.

6.2.3. The Panel through any of the Operating Companies shall establish (and, where appropriate, revise from time to time) joint working arrangements with industry stakeholders or Operators to facilitate the identification, coordination, making and implementation of changes to their operations consequent on an amendment to the Health and Safety Code in a full and timely manner. These working arrangements shall be such as to enable development and evaluation of proposed amendments to the Health and Safety Code, how Operators will proceed in a full and timely manner to make changes to their operations consequent to an amendment to the Health and Safety Code to be made.

6.2.4. Following the review of a proposed revision by the Health and Safety Code Review Panel, the Commission shall review the Panel's recommendation. The Commission shall consider the proposed revision, other views, and any further representations and shall determine whether the proposed revision should be made and, if so, whether in the form proposed or in an amended form.

6.2.5. If the Commission decides that the revision shall be made, the Chairman shall notify each industry operator, in a manner approved by the Commission, of the revision at least [10 Business Days] prior to the revision taking effect. The revision shall take effect with this Health and Safety Code deemed to be amended accordingly from [and including] the date specified in such notification. One representative each of the Discos and Gencos in the Panel shall have the responsibility of drafting the amended Conditions.

6.2.6. After any amendment to the Health and Safety Code, each Industry Operator shall publish the revised version.

6.3. HEALTH AND SAFETY CODE DISPUTES

6.3.1. If any Dispute arises relating to, arising out of or in connection with this Code between:

a. User(s) of the Distribution and Transmission Networks;
b. Person(s) who applies to be a User and Disco; and Between Users, the parties in dispute

shall use their best endeavours to resolve the dispute amicably between themselves or follow the dispute resolution mechanism established by the Commission.