ORDER NO: NERC/2026/013

BEFORE THE NIGERIAN ELECTRICITY REGULATORY COMMISSION ORDER ON THE REGISTRATION AND AUTHORISATION OF GRID-CONNECTED PRIVATE TRANSMISSION SUBSTATIONS

Title

1. This regulatory instrument may be cited as the **Order on the Registration and Authorisation of Grid-Connected Private Transmission Substations.**

Commencement

2. This Order shall take effect from 9 March 2026.

Purpose

3. This Order provides a framework for the registration and authorisation of grid-connected private transmission substation in the Nigerian Electricity Supply Industry ("NESI") owned by bulk electricity consumers, to enhance grid reliability, stability, operational efficiency, and ensure compliance with the provisions of the Grid Code.

Legal Basis

4. The Nigerian Electricity Regulatory Commission ("NERC" or the "Commission") is empowered by section 34 (2)(d) of the Electricity Act 2023 ("EA" or the "Act") to *"license and regulate persons engaged in the generation, transmission, system operation, distribution, supply, and trading of electricity"*.

5. Section 63 (1) of the Act provides that *"Without prejudice to the right of the States of the Federation to make laws and establish markets for the generation, transmission, system operation, distribution, supply of electricity within their respective territories, no person, except in accordance with a license issued under the provisions of this Act or deemed to have been*

issued as provided under this Act, shall construct, own, operate an undertaking other than the undertaking specified under subsection (2), or any way in the business of: electricity generation, excluding captive generation, transmission, distribution, supply, trading or system operation".

6. Section 34 (1)(e) of the Act mandates the Commission to *"ensure the safety, security, reliability, and quality of service in the production and delivery of electricity to consumers".*

Context

7. The Commission has been monitoring grid performance through daily operational and significant incident reports. The Nigerian Independent System Operator's ("NISO") report in 2025 indicated that the Nigerian power grid experienced a total of 677 and 1720 line trips on 330kV and 132kV transmission lines respectively.

8. There are a sizeable number of bulk electricity customers, receiving electricity supply from the grid directly at the 132kV level. These customers own and operate dedicated transmission substations on their premises to service productive activities. Their activities impact the grid performance through interconnections at the point of common coupling.

9. The impact of the grid-connected private transmission substations needs to be monitored to ensure compliance with the provisions of the Grid Code for the Nigerian Electricity Transmission System ("Grid Code") and technical standards with respect to construction, protection, metering, control, communication, operation & maintenance.

10. The Transmission Company of Nigeria Plc ("TCN") has been unable to meet Transmission Loss Factor ("TLF") targets allowed in the Multi-Year Tariff Order ("MYTO") for TCN due to aged infrastructure and poor energy accounting. The impact of the TLF contributed by private transmission substations must be carefully evaluated as part of the effort to improve the efficiency of the overall transmission system.

11. The World Bank, in collaboration with NISO and TCN, is currently executing the Supervisory Control and Data Acquisition ("SCADA"), Energy Management System ("EMS"), and System Telecommunication ("ST") projects to facilitate the visibility and controllability of the activities of grid users by the System Operator. All grid users connected to the transmission system are required to carry out the necessary technology upgrade of their facilities to ensure seamless integration. Y.A. Adj.

Objectives

12. This Order seeks to -

    a. Establish a framework for the registration and authorisation of entities to own and operate a grid-connected private transmission substation in NESI.

    b. Enhance regulatory oversight and compliance with technical specifications and standards in the Grid Code and other relevant regulatory instruments of the Commission.

    c. Improve the safety, reliability, stability, quality, and integrity of grid power supply in NESI.

    d. Facilitate operational visibility of all grid users to the System Operator and ensure market discipline.

    e. Support efficient system planning through comprehensive capturing of data on network elements.

    f. Promote transparency and accountability in the financial settlement for all energy transported through the national grid.

13. For the purposes of this Order, the following terms shall have the meanings assigned to them below –

    a. **Transmission System** – A high-voltage (132kV or 330kV) interconnected network designed to evacuate bulk electricity from power plants over a long distance to major load centers.

    b. **Grid-Connected Private Transmission Substation Owner** - An entity that owns and operates a private transmission substation directly connected to the grid at 330kV or 132kV system voltage, for the purpose of providing a dedicated supply to its own facility or electricity trading pursuant to a grid connection agreement executed with TCN.

    c. **Load Connection** – An electrical connection between the transmission system and the connecting party's facilities where the connecting party receives power from the electric system.

    d. **Bulk Electricity Consumers** - Generally refers to customers connected to electric systems at 132kV and above.

THE COMMISSION HEREBY ORDERS AS FOLLOWS:

A. Registration of existing grid-connected Private Transmission Substation Owners ("PTSOs") -

i. NISO shall formally send a list of the existing grid-connected PTSOs operating in NESI to the Commission. The list of PTSOs shall contain the physical address of the asset, GPS coordinates, as well as contact details of the point person including - name, email address, and telephone number.

ii. NISO shall communicate the provisions of this Order to the PTSOs within 5 days from the effective date of the Order.

iii. Within 45 days from the issuance of this Order, all existing PTSOs shall apply to the Commission for an Independent Electricity Transmission Network Operator ("IETNO") permit to own and operate a grid-connected transmission substation in NESI.

B. Registration of new grid-connected PTSOs –

i. All new PTSOs shall obtain an IETNO permit to own and operate a grid-connected transmission substation in NESI from the Commission before inter-connecting to the grid, and there shall be stringent sanctions for non-compliance as prescribed in sections 63 (4) and (5) of the Act.

ii. All new PTSOs shall adhere to all the regulatory compliance requirements listed in paragraph D of this Order

C. In compliance with the Commission's Regulations for the Application for Licence (Generation, Transmission, System Operations, Distribution & Trading) 2010, prospective applicants for an IETNO permit shall fill an application form and file the under-listed documents, which constitute the minimum requirements for a Permit to be issued to any private entity to own and operate a grid-connected transmission substation in NESI -

i. Certificate of Incorporation.

ii. Valid Tax Clearance Certificate.

iii. VAT Registration Certificate.

iv. Comprehensive Single Line Diagram ("SLD") of the substation showing the point of interconnection with the grid to the load connection point.

v. Submission of technical information of the existing or proposed transmission substation as contained in Schedule I.

vi. Evidence of Grid Connection Agreement ("GCA") executed between the PTSO and TCN.

vii. Evidence of certification of an existing transmission substation issued by the Nigerian Electricity Management Services Limited ("NEMSA).

viii. Approved substation impact assessment study by NISO for new PTSO.

ix. List of 3 (Three) COREN Registered Electrical Engineers or Technologists trained as a qualified Transmission System Operator ("TSO"), Protection Metering and Control ("PM&C"), and Operation & Maintenance ("O&M") experts.

x. Payment of a registration fee of NGN100,000 (One Hundred Thousand Naira).

D. Regulatory Compliance Requirements

i. All PTSOs shall comply with the provisions of the Grid Code, Metering Code, and the Nigerian Electricity Supply and Installation Standards ("NESIS") Regulations 2015 as may be amended from time to time.

ii. All PTSOs shall comply with the following standardisation requirements.

a. Convert incoming transmission line to the private substation from Tee-Off to a Turn-In, Turn-Out configuration.

b. Provide an adequate protection scheme that is interoperable and can be coordinated with other relays within the same protection zone.

c. Carry out substation upgrades where necessary by providing Remote Terminal Units ("RTU") or Substation Automation System ("SAS"), SCADA/EMS, and communication link that will transmit signals up to the nearest TCN substation.

d. Ensure that the load connected to the substation is designed to operate at close to unity power factor to minimise the reactive

power injection on the transmission system, in compliance with section 16.7.2 (b) (i) of the Grid Code, which mandates that *"the off-takers shall maintain a power Factor not less than 0.95 at the connection point"*.

e. Where required to comply with paragraph D(ii)(d) above, the PTSO shall deploy shunt capacitors as a means to control the power factor of their facility and shall be installed on the customer side of the Point of Interconnection ("POI").

f. The deployment of a capacitor shunt shall be predicated on power system studies of the application approved by NISO to prevent transient voltages due to capacitor switching and voltage amplification arising from resonance conditions.

g. Install an automatic Under-Frequency Load Shedding ("UFLS") relay, in compliance with section 18.7 of the Grid Code.

h. NISO, in collaboration with TCN shall specify the amount of load to be shed and frequency set points in accordance with the UFLS compliance requirements of the Grid Code.

i. Comply with NISO's instructions promptly and take appropriate measures to mitigate the impact of their facilities on the UFLS plan.

j. Configure their protection scheme to apply automatic under-voltage load shedding relay to prevent cascading transmission system outages.

k. The specific locations where under-voltage load shedding relay must be installed, and the amounts of load to be shed shall be determined based on power system studies approved by NISO.

E. All existing PTSOs shall ensure full compliance with regulatory requirements specified above by 31 December 2026.

F. NISO shall install and integrate IoT metering system at the point of interconnection of all private transmission substations to the grid within 120 days from the effective date of this Order.

G. All PTSOs shall file a monthly report on the operational and reliability performance of the substation to NISO, in compliance with section 23.5 of the Grid Code. The report shall be filed in the attached format (Schedule II) on the 10th day of the following month.

H. NISO shall conduct scheduled or unscheduled verification visits to the premises of all PTSOs and shall be allowed access for inspection upon provision of a valid identification card.

Dated the 10TH day of MARCH 2026

10/03/2026

Musiliu O. Oseni PHD
Chairman

Dafe C. Akpeneye
Commissioner
Legal, Licensing & Compliance

Schedule I
Technical Information of the Existing or Proposed Private Transmission Substation

	ITEM	Applicant's Response	Remarks
1	Name of incoming transmission line		
2	Supply System Voltage		
3	Incoming Line Configuration (Single or Double Circuit)		
4	Primary Busbar Arrangement (Single, One and half or double)		
5	Type and rating of primary side Circuit Breaker		
6	Type and rating of primary side Isolator		
7	Rating of the Current Transformer (CT)		
8	Rating of the Voltage Transformer (VT)		
9	Type and Specification of Energy Meter Installed on the Primary Side of the Transformer		
10	Type and Specification of Power Quality Meter		
11	Type of power transformer (2-winding or auto transformer)		
12	Capacity rating of power transformers		
13	Primary Voltage of the power transformer		
14	Secondary voltage of the power transformer		
15	Vector group of the transformer		
16	On Load Tap Changer (OLTC) Range		
17	Maximum Sound Level of the Transformer		
18	Transformer grounding		
19	Specification of Under-Frequency Load Shedding Relay		

20	Type and capacity of power factor correction equipment		
21	Specification of Harmonic Filters		
22	Specification and make of indoor control panel		
23	Type and rating of line protection		
24	Type and rating of transformer protection on the primary side		
25	No of outgoing feeders from the substation		
26	Type and rating of feeder protection on the secondary side		
27	Rating of Tripping Unit		
28	Cumulative Battery Bank output DC voltage		
29	SCADA/EMS		
30	Type of Communication Link (OPGW, PLC or Microwave Radio)		
31	Substation Automation (RTU or SAS)		
32	IoT Meter		
33	Total Connected Load (MW)		
34	Peak Load Demand (MW)		
36	Average Load Demand (MW)		
37	Average Monthly Energy Consumption (MWh)		

- **Note that all information provided in this template is subject to on-site verification.**

Schedule II

Submission of Post-Authorisation Monthly Report on the Operational and Reliability Performance of Private Transmission Substation in NESI

General Information	
Name of PTSO	
Month/Year	
Substation Capacity	
Physical Address of the Substation	
GPS Coordinates of the Substation	
Transmission Region	
Name of Reporting Officer	
Telephone Number of the Reporting Officer	
Operational and Reliability Performance	
Name of Incoming Transmission Line	
Monthly Outage Frequency (Numbers) (Attach a list comprising the dates and reason for each outage)	
Monthly Outage Duration (Hours) - (Attach the dates and duration for each day)	
Highest System Frequency Recorded and Date	
Lowest System Frequency Recorded and Date	
Highest System Voltage Recorded and Date	
Lowest System Voltage Recorded and Date	
Highest Power Factor Recorded and Date	
Lowest Power Factor Recorded and Date	
Under Frequency Load Shedding Relay Responses Recorded (Indicate the dates and amount of load shedded)	
Compensation Equipment Response (Indicate the dates and reasons for activation)	
Protection Equipment Response (state the date, time, the particular protection device and fault indication)	
Maximum Load Off-taken (state the date, time and duration)	
Minimum Load Off-taken (state the date, time and duration)	
Maintenance	
Preventive or Condition-Based Maintenance (State the name of equipment and date of maintenance)	

Reactive Maintenance (State the name of equipment, date of maintenance and specific problem solved)	

Name, Signature, and Date

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