NIGERIAN ELECTRICITY MANAGEMENT SERVICES AGENCY

CORPORATE HEADQUARTERS

No. 4, Dar es Salaam Crescent, Wuse II, Abuja, FCT.

PUBLIC NOTICE

SAFETY GUIDELINES ON INSTALLATION OF ROOFTOP SOLAR PHOTOVOLTAIC (PV) SYSTEMS

The Nigerian Electricity Management Services Agency (NEMSA) has observed with serious safety concern the increasing number of fire incidents allegedly linked to improperly installed rooftop solar photovoltaic (PV) systems across the country.

It is important to note that while the adoption of renewable energy is strongly encouraged in line with Nigeria's energy transition objectives, safety must remain paramount. Many of the reported incidents are associated with poor workmanship, use of substandard materials, absence of protective devices, and non-compliance with technical standards and regulations.

Pursuant to Section 176 (m) and Section 184 (8) of the Electricity Act 2023. The members of the public are hereby advised to:

i. engage the services of qualified and NEMSA certified solar PV system installers. These certified professionals possess the necessary skills, experience, and knowledge of technical standards and regulations, helping to prevent electrical accidents and reduce the risk of fires in buildings.

ii. ensure that the completed solar PV system installations or any type are duly Inspected, Tested and Certified safe for use by NEMSA.

Having regard to the above and in line with NEMSA's mandate of enforcement of technical standards and regulations to ensure safety of lives and property in the country, NEMSA hereby issues the following **Guidelines for the Installation of Rooftop Solar PV Systems in Nigeria**:

i. The installation of the rooftop solar PV system must be carried out only by NEMSA certified electrical contractors.

ii. The NEMSA certified contractor must be in possession of his/her valid NEMSA competency certificate during the installation works.

iii. A load assessment of the facility or premises must be conducted prior to installation to ensure the system is appropriately sized and can operate safely.

iv. The roof must be structurally sound and capable of supporting the PV solar system. Panels should be installed using appropriate mounting structures, as weak roof construction or improper installation can result in roof damage, fire hazards, and significant safety risks.

v. Photovoltaic (PV) modules used for rooftop installations should be of the same type, make, and specifications. Using mismatched modules can reduce system efficiency and power output, and may increase the risk of equipment damage or fire.

vi. PV modules with cracks, bent frames, air bubbles, hot spots, or loose junction boxes should not be used, as damaged modules can cause electrical faults, reduce system performance, and increase the risk of fire or equipment failure.

vii. The interconnection between PV modules should be made using properly mated and securely locked male and female connectors (MC4 connectors). Improper use or failure to fully engage MC4 connectors can result in loose or partial connections, which may cause arcing and potentially lead to fire.

viii. Maintain a minimum clearance of 0.13m between the roofing material and the PV modules to ensure adequate ventilation and cooling during high temperatures. Insufficient clearance may lead to overheating, reduced system performance, and potential damage to the modules.

ix. Install DC and AC isolators to enable emergency shutdown. Provide appropriately rated circuit breakers and fuses to prevent overloading and install surge protection devices (SPDs) to protect the system against lightning surges. Ensure proper earthing (grounding) of the entire system, with an earth resistance value of 2 ohms or below.

x. Lightning protection systems should be properly installed on rooftops to safeguard PV modules and other system components against lightning strikes.

xi. Use cables with the appropriate rating, size, and length in accordance with the system design requirements. Using incorrectly sized cables can lead to overheating and may potentially cause a fire.

xii. Provide appropriate fire safety equipment, including fire extinguishers suitable for electrical fires, fire alarm systems, and smoke detectors. A First Aid box and a first aid or electric shock treatment chart should also be available at locations where all the solar components are installed. In addition, safety and danger warning signs must be displayed at locations where all solar components are installed.

xiii. Batteries should be installed in a well-ventilated, secure location away from living areas and heat sources. For lithium batteries, a Battery Management System (BMS) must be provided, and the installation site should be equipped with an appropriate cooling or air-conditioning system to maintain safe operating temperatures.

xiv. When installing a solar system on the rooftop of an existing house, if the system capacity cannot support the entire household load, ensure proper load separation at the distribution board (DB). All solar cables should be neatly routed through conduits or trunking to maintain safety and organization.

xv. Ensure that communication cables and power cables are routed separately and never run together in the same conduit. Combining them can lead to signal interference, degraded system performance, and a higher risk of electrical faults or fire.

xvi. Perform regular checks and maintenance of the rooftop PV system by cleaning the solar panels to prevent dust accumulation and overheating. Periodically inspecting cables, connectors, and the inverter, and promptly replacing any damaged components.

iii. Connected to an existing electricity power system or networks and energized either for temporary or permanent use until such electrical installation has been duly inspected, tested and certified fit for use by NEMSA.

Solar PV system installers and members of the public must take note of the guidelines outlined above and ensure strict compliance. Adhering to these standards is essential for safety, system performance, and regulatory compliance.

Signed

Chief Electrical Inspector of the Federation