Republic of the Philippines
NATIONAL POLICE COMMISSION
NATIONAL HEADQUARTERS PHILIPPINE NATIONAL POLICE
OFFICE OF THE CHIEF, PNP
Camp BGen Rafael T Crame, Quezon City

JUL 20 2020

MEMORANDUM CIRCULAR
NO.:2020-048

PRESCRIBING THE MINIMUM TECHNICAL SPECIFICATIONS FOR 6kW SOLAR POWER SYSTEM

1. **REFERENCES:**
   a. NAPOLCOM Memorandum Circular (MC) No. 2019-002: "Defining the Duty and Authority of the NAPOLCOM to prescribe Minimum Standards for Uniform, Arms, and Equipment to be Procured by the Philippine National Police;

   b. NAPOLCOM Resolution No. 2020-0048: "Prescribing the Minimum Standards for Solar Power System

   c. Memo from D, ES dated March 6, 2020 re: Request for Approval of Technical Specifications re: Solar Power System for PNP Buildings and Facilities;

   d. Memo from TDC dated May 14, 2019 with subject: Approved Program of Expenditure (POE-PA) of the PNP Trust Receipts for 1st Quarter CY 2019 re: Completion and Upgrading of Solar PV Panels (On-grid to Hybrid) for PNP Command Center and

   e. PNP UESB Resolution No. 2020-010 entitled: "Proposed Minimum Technical Specifications for 6kW Solar Power System".

2. **RATIONALE:**

This MC sets forth the minimum technical specifications for 6kW Solar Power System to be used by the different PNP infrastructure and/or facilities.

3. **SITUATION:**

Solar power is clean green electricity sourced from sunlight or in some cases, from the heat of the sun. No greenhouse gas emissions are released into the atmosphere when using solar power in the process of producing electricity. Installing solar power systems in a PNP infrastructure and/or facility setting generally means setting up a solar photovoltaic on the roof or other appropriate area.

Presently, the PNP have various infrastructures such as headquarters, police stations, and facilities at different regions that have been supplied by electricity grid from city or rural areas. However, when an electrical supply fails and power outrage occurs, it basically affects the administrative and operational works of the PNP and an

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alternative green power supply are necessary to back up such as solar power can supplement an electricity to the entire or partial energy consumption of electrical loads in the PNP.

The PNP is taking its step to use an alternative source of energy and it considers the Hybrid Solar Panel systems which use batteries to store energy. It operate as a backup power supply during a power failure, similar to a UPS (Uninterrupted Power Supply). Hence, there is a necessity to formulate the minimum technical specifications for solar power system rating to cope with the electrical loads of PNP infrastructures and /or facilities.

4. **PURPOSE:**

To provide and establish the minimum technical specifications for 6kW Solar Power System that will serve as reference in the procurement of the said solar power system.

5. **DEFINITION OF TERMS:**

For purposes of this MC, the following terms shall mean:

a. **Ampere (A)** – is the unit for measuring electricity.

b. **Electric current** – is measured in amperes (amps) and refers to the number of charges that move through the wire per second.

c. **Hybrid Inverter** – (multi-mode inverter) is an inverter which can simultaneously manage inputs from both solar panels and a battery bank, charging batteries with either solar panels or the electricity grid (depending on which is more economical or preferred).

d. **Ingress Protection (IP)** – refer to the level of protection offered by an electrical enclosure, against solids and liquids. In an environment where dust or water could damage electronic components, a sealed enclosure is used to prevent such ingress and safe house the electronics.

e. **Input Voltage** – is a supply voltage in the system.

f. **Maximum System Voltage (Vmpp)** – is the voltage when the power output is the greatest. It is the actual voltage you want to see when it is connected to the MPPT solar equipment (like an MPPT solar charge controller or a grid-tie inverter) under standard test conditions.

g. **Module Efficiency** – refers to the percentage of sunlight that hits the panel that is converted into usable electricity. The higher the efficiency rating, the less number of panels to be needed will make up a system that meets the energy requirements

h. **Monocrystalline** – more often called single-crystal silicon, in short mono c-Si or mono-Si, is the base material for silicon-based discrete components and integrated circuits used in virtually all modern electronic equipment. Mono-Si also serves as a photovoltaic, light-absorbing material in the manufacture of solar cells.

i. **Open Circuit** – is the difference of electrical potential between two terminals of a device when disconnected from any circuit. There is no external load connected. No external electric current flows between the terminals.

j. **Output Voltage** – indicates the type of electrical current (AC or DC) and the voltage in which a device will emit to safely and effectively power another device.

k. **Photovoltaic** – refers to Photo = "light" and photons = energy particles coming from sunlight; voltaic = producing a voltage or volts. Abbreviation = PV.

l. **Polycrystalline** – or multicrystalline silicon, also called polysilicon or poly-Si, is a high purity, polycrystalline form of silicon, used as a raw material by the solar photovoltaic and electronics industry.

m. **Power Supply** – is a source of power that supplies electric power to an electrical load.

n. **Short Circuit** – refers to how many amps (i.e. current) the solar panels are producing when not connected to a load.

o. **Solar cell, or photovoltaic cell (PV)** – is an electrical device that converts the energy of light directly into electricity by photovoltaic effect

6. TECHNICAL SPECIFICATIONS:

Description: A Solar Power System is a power producing equipment with specific dimensions consisting of solar cells and semiconductor properties enclosed within a material to serve as protection from environment. Such properties convert solar energy into electricity through process of photovoltaic effect. It supplies power directly to the load thru compatible solar power inverter and usually mounted on the rack that is fixed to the ground or rooftop.

A. Solar PV Panel

a.	Cell Type	:	Polycrystalline / Monocrystalline
b.	Nominal Power	:	250 Watts
c.	Module Efficiency	:	15%
d.	Open Circuit Voltage	:	37V
e.	Short Circuit Current	:	8.70A
f.	Maximum System	:	1000V

	Voltage		
g.	Maximum Current	:	9A
h.	Environmental Rating	:	IP65
i.	Dimension	:	Manufacturer's Standard
j.	Maximum Weight	:	20kgs

B. Hybrid Inverter

Description: It is an electrical equipment which receives electrical direct current from compatible solar PV panels and interconnects to battery banks, local electrical loads (off-grid) or electrical grid networks.

a.	Rated Power	:	6kW
b.	Input/output Voltage	:	Philippine Standard
c.	Frequency	:	Philippine Standard or Autosensing
d.	Display and Communication	:	Appropriate Display/Monitor and Communication Connection (Wired and Wireless)

13. EFFECTIVITY:

This MC shall take effect immediately after 15 days from filing a copy thereof at the UP Law Center in consonance with Section 3, Chapter 2, Book VII of Executive Order 292 otherwise known as the "Revised Administrative Code of 1987", as amended.

ARCHIE FRANCISCO F GAMBOA
Police General
Chief, PNP

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