CHAPTER 16

Public Electric Vehicle Charging Stations

16.1 This chapter has been inserted in this Manual on Public Electric Vehicle Charging Station (PEVCS) to assist easy reading and to consolidate some of the relevant provisions exclusively applicable to PEVCS whenever relevant and appropriate. Notwithstanding this chapter, all the laws and provisions in this Manual shall be applicable to PEVCS.

16.2 Definitions

The Definition given in Chapter 1 are applicable herewith. However, the definitions of the terms used specifically in this chapter are given below:

16.2.1 **"electric vehicle or EV"** means a vehicle that uses electric motors and motor controllers for propulsion, and contains an energy storage device, such as a rechargeable storage battery to store electricity and uses it as a transportation fuel to power its electric motors and motor controllers, which is manufactured primarily for use on public streets, roads or highways such as battery electric vehicles, hybrid vehicles, plug-in hybrid vehicles, and extended range electric vehicles;

16.2.2. **"electric vehicle supply equipment or EVSE"** means a complete assembly consisting of conductors, connectors, devices, apparatus, and fittings installed specifically for the purpose of power transfer and information exchange between a branch electric circuit and an electric vehicle.

16.2.3 **"EV Services"** means the charging of a battery of an EV User by an EVSE at a PEVCS

16.2.4 **"EV User"** means any person who owns, uses or operates an EV

16.2.5 **"Margin''** means an amount announced by NEPRA as a margin per unit of electric power to be charged by a PEVCS from time to time from an EV User and duly notified and displayed on the NEPRA website.

16.2.6 **"Maximum Margin"** means the total amount arrived at by adding the tariff fixed for a commercial consumer by NEPRA and the Margin

16.2.7 **"public EV charging station or PEVCS"** means any premises where an EVSE is located for the purposes of recharging of plug-in electric vehicles, including all-electric vehicles and plug-in hybrids by the public and which allows any EV User or operator to access and use the charging station free of charge or on payment;

16. 3 PEVCS's Connection and Category

16.3.1 PEVCS shall be deemed to fall within the category of “commercial” consumer and be subject to the relevant tariff as announced by NEPRA and to all the applicable laws and relevant terms and conditions and more specifically chapter 7 of this Manual.

16.3.2 PEVCS shall be subject to all the provisions of chapter 2 and chapter 11 of this Manual for obtaining a connection and submit the requisite application forms stated therein.

16.3.3 For each EVSE installed at a PEVCS a separate connection will be required and shall be approved pursuant to chapter 2 unless DISCO makes an exception subject to any conditions the DISCO deems necessary.
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16. 4 Maximum Margin

16.4.1 PEVCS shall not charge an EV User in excess than the Maximum Margin for each unit of electric power used in the delivery of EV Services.

16.4.2 DISCO shall ensure that a PEVCS shall not charge in excess than the Maximum Margin from EV Users and shall comply with the terms and conditions as notified by the Authority.

16.4.3 PEVCS shall display on the premises, website and on any online tool (as applicable) at a prominent and visible place the Maximum Margin applicable from time to time for the benefit of the EV Users. The Maximum Margin should be displayed in such a manner to ensure that the EV User is made aware before using the EV Services of the Maximum Margin applicable.

16.4.4 If a PEVCS is found to have charged an EV User a rate higher than the Maximum Margin for EV Services, then DISCO shall be under an obligation to report this fact to the Authority. The Authority can require DISCO take any measures against the owner(s) of the PEVCS amongst others imposing any financial penalties including taking measure to prevent the PEVCS owner(s) in the future own, managing or indirectly being involved in the running of a PEVCS.

16. 5 Metering

16.5.1 PEVCS will be subject to all the requirements stated in chapter 4 and chapter 6 of this Manual.

16.5.2 PEVCS will be required to install any and all meters as required to ensure the number of units consumed by the PEVCS in total and each individual EV User for charging the battery at the PEVCS can be individually and jointly be measured. PEVCS shall be required to follow any directions given by DISCO in this regard.

16.5.3 DISCO shall inspect the functioning of any meter forming part of EVSE to ensure it accurately measures the units of electric power consumed by an EV User and DISCO may recommend any alterations in the metering equipment to protect its integrity and accuracy.

16.5.4 If DISCO dedicates any defect or interference with the EVSE, which has or can cause wrong billing to EV Users, then DISCO can require PEVCS to take all steps to remedy the defect/interference and further can take any penal measures applicable under this Manual

16.7 Billing

PEVCS shall be at liberty to design any bill/invoice which is to be given to the EV User for the use of the EV Services.

16.8 Safety and Technical Standards for PEVCS and EVSE

16.8.1 Safety Standards for PEVCS

DISCO shall ensure PEVCS comply with the highest safety standards and are in compliance with any industrial and technical standards issued by any regulatory body of Pakistan, including Pakistan Standards & Quality Control Authority from time to time for EVSE and for the overall Premises on which the PEVCS resides as well as any technical and safety standards provided by a DISCO or inserted in this Consumer Services Manual.

16.8. 2 PEVCS shall adhere to all the technical and safety requirements stated in this Manual and more specifically chapter 12.

16.8.3 PEVCS and the EVSE must conform with all approved and prevailing technical and safety standards approved by any relevant bodies in Pakistan."

16.8.3 The owner of PEVSE shall ensure that:

16.8.4 **Design**

a) It coordinates with the DISCO to obtain EVSE installation requirements, specifications, and other relevant information and documents. This includes any interconnection documents required by the DISCO for new service requests and sites requiring a service upgrade;

   Provided that the DISCO shall be bound to provide such information and documents in response to the request free of cost within seven working days.

b) the installation, design and site layout shall consider the potential risks during the installation, operation, and maintenance of the EVSE and all support equipment including wiring, conduit, and protection devices;

c) the design shall consider protection against vehicle impact and EVSE shall be installed in a position to minimize the likelihood of damage from vehicle impact;

   Provided that in case the likelihood of damage from vehicle impact cannot be minimized, the use of additional protection barriers shall be installed in accordance

with IEC 62262 i.e. a typical protection against mechanical stress impact for EVSE installed outdoors is IK10.

16.8.5 **Installation**

EVSE shall: -

a) be installed in a position to avoid obstruction to public or private footpaths and it shall not be installed in such a position that causes unnecessary trip hazard.
b) have electrical wiring routed and suitably clipped or enclosed in a containment system to avoid creating potential trip hazard and contact risk to the public. Wire routing requiring a conduit shall either be installed underground at the appropriate depth in accordance with local requirements or along walls or ceilings when necessary.
c) be installed at existing petrol stations, shall be located outside the hazardous zone;
d) be installed so as to minimize the distance between the EV inlet and the charging equipment. The cord installed for charging vehicles shall have appropriate length to ensure minimum distance;
e) be installed with precautions to ensure that live parts i.e. hot wires/loaded circuits are either not accessible or cannot be touched during installation, operation and maintenance;
f) be designed and installed to enable maintenance and service work to be carried out safely;
g) be designed and installed to comply with the requirements for health, safety and environment as set out in this Manual;
h) be designed to prevent unauthorized usage of the charging facilities such as housing the socket outlet in a padlocked box or using an access card for energizing charging facility etc. may be provided as necessary especially for outdoor installations;
i) be installed with sufficient space around it to allow for adequate ventilation and cooling of the equipment (e.g. DC charging equipment incorporating rectifiers). The designer and installer of the EV must refer to the manufacturer's installation and operational instructions supplied and comply with requirements stated in relevant standards;
j) have and the all associated equipment an IP rating suitable for the installation location; for indoor locations a minimum ingress protection of IP44 shall be used; for outdoor locations a minimum ingress protection of IP55 shall be used;
k) comply with the relevant quality and safety standards.
l) the connector type installed shall comply with IEC 62196 (Type 2 for level 2 charging and CCS2 for DC charging).

16.8.6 **Operations**

a) EVSE shall be set up in compliance with relevant standards and codes to ensure proper calibration, accurate metering and transparency;
b) EVSE shall be capable to provide for technical basis for billing options, metering accuracy and network connectivity;
c) EVSE shall be capable of upgrades to enable Smart-grid-capable through Open Charge Point Protocol (OCPP) transmission and an integrated 4G/5G modem;

d) EVSE shall not create faults (typically through a circuit breaker/overcurrent protection), harmonics and frequency misbalance in the distribution network;
e) EVSE shall have capability to detect and monitor faults and generate signals/alarms in case of any fault is detected as required under international standards like J1772. It shall be capable to react to critical as well as small residual faults, reports it and deliberately terminates the charging process before the residual current device (RCD) is tripped;
f) EVSE shall be connected to energy management systems (EMS) through the standardized EEBUS protocol for energy management, data exchange and control;
g) EVSE shall be capable to have bi-directional communication with the vehicle as well as intelligent connection to EMS, monitor the internal hardware of the charging system, the user interfaces as well as the charging socket and the charging cable. However, it shall be ensured that the EVSE shall not back-feed the grid in the case of an outage;
h) the charging infrastructure results in maximum availability and safety for both the charging system and the vehicle to be charged.

16.9 **Complaints**

EV Users may raise any complaints against the PEVCS and DISCO pursuant to chapter 10 and chapter 15 an EV User shall be deemed to be a consumer for purposes of raising any complaint.