Safety Advisory/ Standard Operating Procedure (SoP) for EV Charging Stations (EVCS) in Multistorey Buildings (Residential ,Commercial Premises/ Hotels/ Hospitals/ Malls/ Car Parks/ Places of Public Gatherings) for Two/ Three/ Four Wheelers across Maharashtra

Objective: *The Objective of Standard Operating Procedure (SoP) is to ensure the Fire and Electrical safety of electrical vehicle charging stations during its operation cycle to safeguard the human life and property.*

Scope of Work: *As the charging methods could be either AC (Alternating Current) or DC (Direct Current) the safety requirements shall be able to address both working conditions.*

For the safe and effective Functioning of the EV Charging Stations (EVCS) the following guidelines must be followed :

1. Charging station installed by Housing societies, Malls, Residential, Multi story Buildings and Office complexes, Restaurants, Hotels, etc. provided that such stations meet the technical, Safety as well as performance standards and protocols laid down by Central Electricity Authority (Technical Standards for connectivity of the Distributed Generation Resources) Amendment Regulations 2019 and Central Electricity Authority (Measures related to Safety and Electric Supply) Amendment Regulations 2019) Maharashtra Fire Prevention and Life Safety Measures Act, 2006 and Directives issued from Urban Local Bodies Time to time.

2. All the electrical installation work for the charging station shall be carried out by the Licensed Electrical Contractor approved by the state government of Maharashtra

3. Where multiple chargers are in use, there should be clear and prominent notices at each charging point indicating for which equipment or vehicle(s) i.e., AC or DC it is suitable.

4. Where rapid charging points – known as DC fast charge and operating at 500V DC – are provided, they should be clearly differentiated from conventional charging points because of the hazards associated with the direct current, Measures should be taken to ensure that signs and labels associated with these chargers are not removed or defaced.

5. Where charging points are to be provided in multistorey car parks, consideration should be given to locating these in the open air at roof deck level to minimize potential for fire spread within the structure.

6. All electric vehicle charging points shall be installed so that any socket-outlet of supply is at least 800 millimeters above the Highest Flood level.

7. The electric vehicle parking place shall be such that the connection on the vehicle when parked for charging shall be within five meter from the electric vehicle charging point.

8. The charging point should be child-proof and preferably installed away from any children's play area.

9. Charging bays should be signed and marked prominently on the ground to allow vehicles to park close to the charging point and prevent the stretching of charging cables. The length of charging cables should be sufficient to allow their use with the intended equipment without risk of damage.

10. Charging points should be protected against mechanical damage by vehicles. They should be installed above ground level and be located on a raised island, or be protected by Krebs, bollards, or metal barriers. Charging points should also be protected against the ingress of water and foreign objects.

11. The parking of other vehicles in charging areas should be prohibited. In some cases, the introduction of barriers or other physical measures to prevent charging bays being used as conventional parking spaces, may need to be considered.

12. Where it is not practicable to provide this degree of physical separation of a vehicle charging area within a building as mentioned above (and outside the premises), no charging should be undertaken within 10m of any combustible materials: be they waste materials, stock, or combustible elements of the structure. Similarly, no charging should be undertaken within 15m of hazardous installations such as transformers, flammable liquid stores and liquefied petroleum gas tanks.

13. All chargers and associated equipment should be installed, used, and maintained in accordance with the manufacturer's instructions. Servicing and maintenance should be carried out by a competent licensed electrician.

14. Electric Vehicle Supply Equipment (EVSE) shall be type tested by an agency /lab accredited by National Accreditation Board for Testing and Calibration Laboratories (NABL) or any other regulatory authority for this purpose from time to time.

15. Where the connection point is installed outdoors, or in a damp location, the equipment shall have a degree of Ingress Protection Code) in accordance with IS/IEC 60529.

GENERAL SAFETY PROVISIONS RELATED TO E-SCOOTERS/BYCYCLE

1. While it is recognized that the users of this equipment have mobility difficulties, in blocks or flats and similar accommodation, e-scooters should not be taken to floors / Individual Flats for Charging Purpose.

2. Wherever possible, e-scooters should be parked and charged in locations away from harms-way and open to sky locations, designed for this purpose.

3. E-scooters should not be left parked in escape routes where they may form a fire hazard, or an obstruction in the event of the building being evacuated.

4. Where a dedicated e-scooter storage area is not provided, it is preferable for e-scooters to be charged during the day rather than at night, when people may be asleep in the building. Where this is not practicable, the process should be started manually and monitored for a short period before being left to operate unattended.

5. Where portable chargers are in use for e-scooters in commercial premises, they should be inspected periodically.

6. The batteries of e-scooters should not be covered by blankets or similar insulating materials when being charged.

7. For the E-Scooters/Bicycles with detachable/Portable batteries owner shall not use household 15A/3 pin switch socket for EV charging purpose. Dedicated EV Charger confirming to relevant standards shall be installed and used for the said purpose.

ELECTRCAL SAFETY PROVISIONS RELATED TO CHARGING STATIONS

1. Each EV charging installation shall have sufficient sanction load to accommodate house load along with EV charging in addition to it. Adequate measures shall be observed to mitigate the load requirements for EV charging by the owner. Also, augmentation of the wiring and cabling along with protection system must be carried out

2. Each electric vehicle charging points shall be supplied individually by a dedicated final sub-circuit protected by an over current protective device such as MCB complying with IS/ IEC60947-2, IS/IEC60947-6-2 or the IS/IEC60269 series and the over current protective device shall be part of a switchboard

3. All electric vehicles charging stations shall be provided with protection against the overload input supply and output supply fittings.

4. Suitable lightning protection system shall be provided for the electric vehicles charging stations as per Indian Standards Code IS/ IEC 62305.

5. The electric vehicle charging station shall be equipped with a protective device against the uncontrolled reverse power flow from vehicle.

6. If in case EV Charging station is being used for public charging purpose an emergency push button shall be provided at the power incomer side for disconnection of power supply to public EV charging station.

7. Three phases Electrical Vehicle Supply Equipment (EVSE) shall be equally loaded in all phases.

8. All residual current device for the protection of supplies for electric vehicle shall,

    (a) Have a residual operating current of not greater than 30 mA.

    (b) interrupt all live conductors, including the neutral; and

    (c) Have a performance at least equal to Type A and be in conformity with IS732

9. Where required for service reasons, discrimination (selectivity) shall be maintained between the residual current device/miniature circuit breaker of suitable type protecting a connecting point and installed upstream.

10. A Surge Protective Device (SPD) shall be installed upstream of residual current device to limit transient over voltages due to lightning or switching

11. All electric vehicle charging stations shall be provided with an earth continuity monitoring system that disconnects the supply if the earthing connection to the vehicle becomes ineffective.

12. Earthing of all electric vehicle charging stations shall be as per IS 732

13. The cable may be fitted with an earth-connected metal shielding and the cable insulation shall be wear resistant and maintain flexibility over the full temperature range.

14. No flammable or combustible material, other than those which form parts of the vehicle and their associated chargers, should be stored within the designated charging area.

15. Enclosure for charging station shall be made of fire-retardant material with self-extinguishing property and free from halogen

16. Fire Detection, alarm and control system shall be as per relevant Indian Standards.

17. The power cables/wires laid for EV charger(s) shall not be taken along other service pipes, gas lines and fire exit paths.

18. Power supply cables used in charging station or charging points shall conform to IEC 62893-1 and 17505(Part-1) (Standard for Fire Survival Cables) and its relevant parts.

The Installation shall conform to the following Act, Rules, and Regulations & Standards:

1. Electric Vehicle (EV) policy Maharashtra 2021
2. The relevant provisions of the Central Electricity Authority (Measures Relating to Safety and Electric Supply) Regulations, 2010 and The Electricity Act, 2003.
3. Central Electricity Authority (Measures Relating to Safety and Electric Supply) Amendment Regulations, 2019.
4. Central Electricity Authority (Technical Standards for connectivity of the Distributed Generating Resources) Amendment Regulations, 2019.
5. Ministry of Power, Government of India revised guidelines &standards order №12/2/2018-EV (Comp No. 244347) dated14/01/2022
6. IS 17017 Series of Standards & IS/ISO 15118
7. Various orders/circulars related to EV charging stations published by CEI Maharashtra government

Outward No. CEI/Tech/ 283 /2022
Office of the Chief Electrical Inspector
Industries, Energy & Labour Department
3rd Floor, Administrative Building,
Ramakrishna Chemburkar Marg,
Chembur (East), Mumbai-400071
10 OCT 2022

(Dinesh Khonde)
Chief Electrical Inspector,
Industry, Energy and Labour department,
Maharashtra

Copy to -

1. The Hon. Principal Secretary, Energy department, Mantralaya, Govt.of Maharashtra for information.
2. The Hon. Principal Secretary, Ministry of urban Development and Housing Affairs department ,Mantralaya , Govt.of Maharashtra for information
3. The Hon. Principal Secretary, Disaster Management Department ,Mantralaya , Govt.of Maharashtra for information
4. The Hon. Municipal Commissioner, Municipal Corporation of Greater Mumbai (MCGM), for information.

5. The Hon. Addl. Municipal Commissioner (Western Suburb), Municipal Corporation of Greater Mumbai, for information.
6. The Hon. Principal Secretary, Transport Department, Mantralaya, Govt.of Maharashtra for information.
7. The Hon. Commissioner for Cooperation and Registrar, Cooperative Societies, for information.
8. The Director, R.I.O. (West), CEA Mumbai for information
9. Chairman & MD, Maharashtra State Electricity Distribution Company Limited (MSEDCL) for information
10. General Manager, Brihanmumbai Electric Supply & Transport (BEST) for information
11. Chief Executive Officer & Managing Director, TATA Power Company Limited for information
12. Vice President, Adani Electricity Mumbai Limited for information
13. Chief Executive Officer , Slum Rehabilitation Authority (SRA), Mumbai for information
14. The Hon. Principal Secretary -I, Transport Department ,Mantralaya , Govt. of Maharashtra for information
15. The Hon. Principal Secretary -II, Transport Department ,Mantralaya , Govt. of Maharashtra for information
16. The Chief Fire Officer, Mumbai Fire Brigade, Mumbai for information
17. The Hon. Municipal Commissioner Ahmednagar/ Amravati/ Aurangabad/ Bhiwandi/ Chandrapur/ Jalgaon/ Kalyan-Dombivli/ Kolhapur/ Mira- Bhayander/ Nagpur /Nanded-Waghala/ Nasik / Navi Mumbai/Panvel/ Pimpri Chinchwad/Sangli/ Miraj and Kupwad / Thane/ Ulhasnagar/Vasai-Virar Municipal Corporation for information.