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**Specification of operation and management for
electric vehicle charging/battery swap infrastructure**

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Foreword

This standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This standard was proposed by the National Energy Administration.

This standard shall be under the jurisdiction and interpretation of the Energy Industry Electric Vehicle Charging Facilities Standardization Technical Committee.

Drafting organizations of this standard: State Grid Corporation, State Grid Jibei Power Co., Ltd., China Electric Power Research Institute, Nanrui Group Co., Ltd., Xuji Group Co., Ltd., State Grid Zhejiang Electric Power Company.

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The opinions or suggestions of this standard during the implementation process are fed back to the Standardization Management Center of China Electricity Council (Beijing Baiguang Road Lane 2, No.1, 100761).

Specification of operation and management for electric vehicle charging/battery swap infrastructure

1 Scope

This standard specifies the operational management duties, management content and related requirements for electric vehicle charging/battery swap infrastructure.

This standard is applicable to electric vehicle charging/battery swap infrastructure using conductive charging, including charging stations, battery replacement stations, battery distribution centers, charging spots, etc.

2 Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document; for the undated documents, only the latest version (including all the amendments) are applicable to this standard.

GB/T 19596-2004 Terminology of electric vehicles

GB/T 29317-2012 Terminology of electric vehicle charging/battery swap infrastructure

GB/T 29318-2012 Electric energy metering for electric vehicle off-board charger

GB/T 28569-2012 Electric energy metering for electric vehicle AC charging spot

GB 50229-2006 Code for design of fire protection for fossil fuel power plants and substations

DL/T 448-2000 Technical administrative code of electric energy metering

3 Terms and definitions

The terms and definitions established in GB/T 29317-2012 apply to this standard.

- b) The cable is in good contact and the connector is not overheated; the charging bracket is in good contact and the contact locking mechanism is in good condition;
- c) The indication instrument and signal indication are normal;
- d) The appearance, function and safety protection of the AC charging spot are normal;
- e) The appearance of the battery box is clean; the casing is free of cracks and liquid leakage;
- f) The monitoring system display is normal, the computer and other hardware are running normally, the communication channel is normal;
- g) The charging/battery swap area, battery storage rack and battery detection and maintenance area are well ventilated, the lighting and firefighting equipment are in good condition, the temperature meets the requirements, and there are no flammable or explosive materials;
- h) Safety and firefighting equipment are placed in accordance with regulations, easy to access, the firefighting channel is free from blockage.

6.3.3 Special patrol inspection

Special patrol inspections of charging/battery swap infrastructure shall be carried out:

- a) When there is special weather such as wind, fog, rain, ice, and hail;
- b) When the equipment is newly put into operation or put into operation again after being repaired, rebuilt, or long-term outage;
- c) When suspicious phenomena are found during operation of the equipment.

6.4 Charging/battery swap operation

- a) The charging/battery swap operation procedures or work instructions shall be formulated to regulate the charging/battery swap operations;
- b) Safety protective gear such as overalls and insulated shoes shall be worn during operation. During manual charging/battery swap operation, there shall be personnel monitoring;
- c) It shall confirm that the charging connection is correct before charging;
- d) During battery swap operation, it shall be carried out in strict accordance with the battery swap process;

the development of the accident, isolate the fault point, and remove its threat to personal and equipment safety;

- c) When handling accidents, comprehensive analysis shall be carried out in accordance with the weather, working conditions, monitoring signals, metering instructions, etc. at that time, and the nature and scope of the accident shall be judged in time;
- d) After the emergency repair is completed, detailed records shall be made and the on-site accident handling report shall be sorted in time.

8 Defect management

8.1 Defect classification

Charging/battery swap infrastructure can be classified into critical, serious and general defects in accordance with the degree of defects. The operation and maintenance unit (department) shall establish a sound defect management system for charging/battery swap infrastructure to ensure the safe operation of the charging/battery swap infrastructure.

8.1.1 Critical defect

Critical defects refer to defects in the charging/battery swap infrastructure that directly threaten the safe operation and need to be dealt with immediately. For example, the following:

- a) The charging/battery swap equipment or the battery box insulation is seriously damaged;
- b) The busbar and cable of the charging device are overheated;
- c) The battery box emits smoke;
- d) The temperature of the battery box pole exceeds limit for a long time;
- e) The battery box connector is damaged and the locking mechanism is loose;
- f) The load-bearing components and transmission mechanism of the battery swap equipment are broken and worn.

8.1.2 Serious defects

A serious defect is a defect that poses a serious threat to the person or equipment, which must be dealt with as soon as possible even though operation can be maintained, for example:

- a) Monitoring communication failure during charging/battery swap services;

infrastructure shall abide by the national safety production related laws and regulations, clarify safety objectives, and implement safety responsibilities.

10.1 Safety control

- a) It shall take organizational and technical measures to ensure safety in the operation and maintenance of charging/battery swap infrastructure;
- b) All staff of the charging/battery swap infrastructure shall be informed of the work area, safety measures, surrounding live objects and dangerous points before entering the site;
- c) It shall implement the relevant provisions of the safety work procedures, the person in charge of work and the safety management personnel shall supervise and promptly stop and correct unsafe acts;
- d) It shall perform regular safety inspections and anti-violation pick-up activities to increase safety supervision and anti-violation work;
- e) It shall fully implement risk factor identification, evaluation and control procedures, to effectively control risk factors.

10.2 Fire safety

- a) It shall establish the operational procedures for the fire safety system and fire safety equipment, and implement it strictly;
- b) It shall establish firefighting facilities distribution maps, ledgers and records, and arrange special person to manage them, the contents of the ledgers include the nameplate parameters of the fire-fighting facilities, the place of setting, and the regular inspection results;
- c) It shall perform one inspection of the firefighting facilities and materials on a monthly basis, fill the inspection records, and any problems such as expiration and invalidation shall be reported to the competent department in time;
- d) It shall organize staff for firefighting training regularly to make them be familiar with the correct use of firefighting materials;
- e) It shall hold regular fire emergency drills;
- f) Smoking is prohibited in critical fire prevention areas and shall be clearly marked;
- g) The inspection of the fire alarm system shall be included in the comprehensive inspection management. Any abnormalities or faults shall be reported and handled in time.

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