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Safety operation management regulation for hydrogen fueling facilities of hydrogen vehicles

氢能车辆加氢设施安全运行管理规程

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Safety operation management regulation for hydrogen fueling facilities of hydrogen vehicles

1 Scope

This technical guidance document specifies the management regulation involving the safety operation, personnel, equipment safety, gas quality, production operation, supervision and inspection, and emergency plans for hydrogen fueling facilities of hydrogen vehicles.

This technical guidance document applies to the safety operation management of facilities involved in providing hydrogen fueling services for hydrogen vehicles with high-pressure gaseous hydrogen, liquid hydrogen, and hydrogen enriched compressed nature gas as fuel.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

Provisions on special equipment accident reporting, investigation and handling (Order No. 115 of the General Administration of Quality Supervision, Inspection and Quarantine)

Regulations on the safety management of hazardous chemicals

Safety production license regulations

Regulations on fire safety management of organs, organizations, enterprises and institutions (Order No. 61 of the Ministry of Public Security of the People's Republic of China)

3 Terms and definitions

The following terms and definitions are applicable to this document.

3.1

Hydrogen fueling facilities

4.2.2 The first person in charge of the operating unit shall be the person in charge of unit safety, who is responsible for organizing the formulation and implementation of the unit's safety production rules and regulations and operating procedures, and is primarily responsible for the unit's safety accidents.

4.2.3 The operating unit shall have a safety officer on duty for each shift, who is responsible for supervising and inspecting the implementation of safety measures and correcting violations.

4.3 Additional safety operation management

For additional safety operation management related to the hydrogen fueling station, refer to Appendix A.

5 Personnel management

5.1 Safety education

The operating unit of the hydrogen fueling facilities shall carry out the necessary education and training on the safety production knowledge for the employees, so that the employees can be familiar with the relevant safety production rules and regulations and safety operation procedures, and master the safety operation skills of the position.

The operating unit shall urge the employees to strictly implement the safety production rules and regulations and safety operation procedures, and truthfully inform the employees of the dangerous factors, preventive measures and accident emergency measures existing in the workplace and the job.

The content and schedule of safety education shall be implemented in accordance with the relevant content of safety education management regulations.

5.2 Technical training

5.2.1 The operating unit of the hydrogen fueling facilities shall provide professional technical education and training to the operators, and confirm that the operators have obtained the operating qualifications for the relevant positions.

5.2.2 Operators involved in the operation of hydrogen fueling facilities shall hold a valid operation certificate before they can operate. It is strictly forbidden for those who do not have the refueling certificate or those with inconsistent operation certificate to carry out related operations.

5.2.3 Where the operator's operation certificate does not match the operation content, or the operation certificate has expired, it will be regarded as not having the operation certificate for this operation.

5.2.4 The managers, technical leaders, equipment managers and operators of the operating unit of the hydrogen fueling facilities shall receive professional technical training from the corresponding professional training institutions, and obtain the qualification certificate issued by the relevant department.

5.3 Assessment and inspection

According to the safety education and training management regulation, the employees' knowledge and practical operation of fire protection, dangerous goods safety and hydrogen fueling operation shall regularly checked and assessed. Those who fail the assessment shall be laid off for retraining, and take up the post with a certificate only after passing the training. Employees who are not qualified for safety production education and training are not allowed to work.

6 Equipment safety management

6.1 General

The operating unit of the hydrogen fueling facilities shall, in accordance with the relevant national equipment safety standards, regulations and systems, formulate and improve the equipment safety management system and regulations of its own unit, and formulate equipment safety operation procedures.

6.2 License confirmation

6.2.1 The use, maintenance and replacement of equipment related to hydrogen fueling facilities shall comply with the relevant national licensing management regulations such as the *Regulations on Safety Supervision of Special Equipment*, *Regulations on the Safety Management of Hazardous Chemicals*, and *Regulations on Safety Production Licenses*.

6.2.2 The use of pressure vessels, safety devices and other equipment that requires the management of production license, use license, etc. shall be provided with valid qualification certificates.

6.2.3 The replacement or addition of safety-related equipment accessories shall comply with relevant safety management regulations.

6.2.4 Before entrusting external units to carry out construction operations such as equipment maintenance and installation, the qualifications of the construction unit and personnel shall be confirmed; units and personnel that do not meet the qualifications shall not be allowed to perform safety-related operations for the unit.

6.3 Running and using

6.3.1 Equipment operators shall receive relevant equipment use training and safety education, be familiar with the equipment operation requirements and procedures, and

8 Production operation management

8.1 System, process and regulation

The operating unit of the hydrogen fueling facilities shall formulate relevant safety operation management system, process, specification, etc., and strictly abide by them. The establishment of system norms shall take the protection of people's safety as the main establishment principle.

According to the structure, configuration, scale and other characteristics of different hydrogen fueling facilities, scientifically and rationally formulate various safety management systems and specifications, and ensure that the system is reasonable, effective and feasible.

For the preparation of the quality and safety management system for hydrogen fueling stations, refer to Appendix B; for common forms, refer to Appendix C.

8.2 Safety operation management system of hydrogen fueling facilities

8.2.1 Operation site safety management system

According to the structural characteristics, equipment requirements, fueling mode and fueling scale of the unit's hydrogen fueling facilities, combined with the physical and chemical characteristics of high-pressure hydrogen or liquid hydrogen, the operation site safety management system shall be formulated, to put forward requirements for running operation, inspection, recording, shift handover, etc., and standardize the safety behavior of operators.

8.2.2 Fire safety management system

In accordance with the requirements of the *Regulations on Fire Safety Management of Organizations, Groups, Enterprises, and Institutions*, formulate fire extinguishing plans, fire protection files, education programs, etc., deploy volunteer firefighters, equip corresponding firefighting equipment, and conduct regular fire drills and other content.

8.2.3 Equipment safety management system

In accordance with the management regulations of special equipment and hazardous chemicals and the characteristics of the hydrogen fueling facilities of the unit, propose safety regulations and management procedures for the operation, use, maintenance, emergency repair, replacement, deactivation, resumption of operation, scrapping, and spare parts management of main production equipment and safety equipment.

8.2.4 Staff safety management system

Combined with the characteristics of the hydrogen fueling facilities of the unit, put forward safety requirements for the staff, formulate a staff safety management system

to standardize the safety requirements and supervise the implementation, and conduct regular training and assessment.

8.2.5 Safety inspection management system

Develop a safety inspection management system. According to the characteristics of the facility, determine the inspection content, method, cycle, scope, processing flow, etc.

8.2.6 Accident reporting and handling process

The operating unit of the hydrogen fueling facilities shall formulate a relevant accident reporting and handling process for the occurrence of accidents such as casualties and major equipment damage during the operation of the hydrogen fueling facilities, and shall promptly report safety accidents that occur in production in accordance with the prescribed process. No omission, concealment, or false report of the accident shall be allowed.

8.2.7 Periodic inspection system

Firefighting equipment, hydrogen leakage monitoring equipment, pressure vessels, pressure pipelines, safety accessories, lightning protection facilities, anti-static facilities and other equipment and devices used in hydrogen fueling facilities shall be regularly inspected and checked in accordance with relevant regulations, to ensure their effectiveness, safety and accuracy of use.

Make sure that all related equipment is used and spared within the validity period. Formulate a regular inspection system, and compile a periodic inspection catalog to standardize the entire process of inspection work from planning, dismantling, inspection, restoration, and failure treatment.

8.2.8 Security work management system

Establish a safety and security management system for daily and emergency situations of the operating unit of the hydrogen fueling facilities, such as entry and exit of personnel and vehicles, and emergencies.

8.3 File management and data recording

In order to standardize the recording and use of operation information and make the operation failures of hydrogen fueling facilities traceable, it is necessary to stipulate the requirements, methods and processes involved in the recording, preservation and use of information, and record the following data in real time and save regularly.

a) operation log (operation parameters, fueling information, audio and video, etc.) of equipment and hydrogen fueling facilities, location information for addition of mobile hydrogen fueling facilities;

b) maintenance records;

When operators perform operations such as inspections, changing equipment operation parameters, and fueling vehicles, they must record relevant information in the operation log in a timely and accurate manner. No one may modify, delete, or make up the records out of thin air.

8.6.6 Emergency response

In the event of sudden safety hazards of equipment and personnel during the operation, the relevant personnel shall promptly deal with it in accordance with the relevant provisions of the emergency plan, to ensure the safety of personnel and minimize the risk of injury to personnel.

8.6.7 Accident reporting

In the event of casualties, major equipment damage and other accidents, the person concerned or the discoverer shall immediately report to the person in charge of safety of the unit in accordance with the accident handling and reporting process of the emergency plan, and report to the police in case of emergency. The person in charge of safety of the unit shall immediately report to the higher level in accordance with the provisions of the accident reporting and handling process. No concealment, false reporting, or omission of reporting is allowed.

9 Supervision and inspection

9.1 The operating unit of the hydrogen fueling facilities shall conduct self-inspection on a regular basis.

9.2 The operating unit of the hydrogen fueling facilities shall conduct daily safety inspections on the pressure vessels, pressure pipelines, safety accessories, gas detection instruments, measuring instruments, etc. used, and regularly take the initiative to apply for inspection and verification to the relevant departments.

9.3 Where an accident occurs to the special equipment in the operating unit of the hydrogen fueling facilities, the accident shall be investigated and dealt with in accordance with the relevant national regulations, and reported to the relevant functional departments.

9.4 The operating unit of the hydrogen fueling facilities shall regularly organize safety inspection of the unit. The main contents of the inspection include: the implementation of the system of responsibility in safe production, the implementation of the safety system and operating procedures at the job site, the safety of equipment, the integrity of fire-fighting equipment and the management of basic data, as well as the rectification of hidden dangers.

9.5 The operating unit of the hydrogen fueling facilities shall immediately organize rectification in response to the problems and hidden dangers found in various

Appendix A

(Informative)

Supplementary regulations on safety management

A.1 The hydrogen compressor room, hydrogen pressure regulator room, hydrogen production room and other rooms in the hydrogen fueling station, the skid-mounted hydrogen fueling facilities, mobile hydrogen fueling vehicles and other places where hydrogen leakage is easy to accumulate on the top shall be equipped with an alarm device for exceeding the limit of hydrogen concentration in the air. It shall alarm when the hydrogen content in the air reaches 0.4%, and start the corresponding accident exhaust fan when it reaches 1%, and identify the cause in time. The alarm facilities required for the remaining parts shall comply with the relevant provisions of GB 50516.

A.2 For ordinary steel cylinders or long-tube steel cylinders that transport or use hydrogen, it is strictly forbidden to run out of hydrogen, and a residual pressure of more than 0.2 MPa shall be retained. It is strictly forbidden to knock or collide the gas cylinder; keep the gas cylinder away from the heat source.

A.3 The operation and maintenance personnel in the hydrogen fueling station shall wear anti-static work clothes and anti-static shoes during work; it is strictly forbidden to bring in fire. Before entering the equipment area and performing hydrogen fueling operations, touch the static discharge column to remove static electricity from the body. Do not knock hydrogen equipment, pipelines and containers at will; do not touch running equipment, pipelines and containers at will.

A.4 Hydrogen equipment, pipelines, and containers shall be purged and replaced with nitrogen – to analyze that the oxygen content does not exceed 0.5% -- before they are put into operation, before overhauling hot work, or if they are out of use for a long time.

A.5 For the maintenance of hydrogen equipment, pipelines and containers, the corresponding power supply and gas source shall be cut off, and the connection with the equipment, pipelines and containers that are still in operation shall be cut off with blind plates; the maintenance shall be carried out after nitrogen purge and replacement are qualified. Air tightness test and leakage test shall be carried out after maintenance, which shall comply with the relevant provisions of GB 50516.

A.6 The condensed water in the hydrogen equipment, pipelines and containers shall not be discharged at will. The hydrogen shall be discharged through the vent pipe with the hydrogen flame arrester; the condensed water shall be discharged through the drain device.

A.7 When a hydrogen fire occurs at a hydrogen refueling station, it shall be dealt with immediately according to the emergency plan; the hydrogen gas source shall be cut off

Appendix B

(Informative)

Quality and safety management manual (Reference)

B.1 Basic situation of the hydrogen fueling station

B.1.1 Responsibilities of the hydrogen fueling station

B.1.2 Safety and quality control system diagram

B.1.3 Hydrogen chemical hazard characteristics and safety performance

B.1.4 Brief introduction of this hydrogen fueling station

B.1.5 Site staff register

B.2 Basic system of safety management

B.2.1 Safety production policy, principles and basic work requirements

B.2.2 Job responsibilities of various personnel

B.2.3 Safety production responsibility system

B.2.4 Safety education system

B.2.5 Safety inspection system

B.3 Regulations on fire control, fire and explosion-proof management

B.3.1 Requirements for fire protection of the hydrogen fueling station

B.3.2 Responsibilities for fire management of the hydrogen fueling station

B.3.3 Hot work management standards

B.3.4 Fire and explosion-proof management standards

B.3.5 Management system of fire-fighting equipment of the hydrogen refueling station

B.4 Site safety management regulations

B.4.1 Instructions for personnel entering the station

B.4.2 Instructions for vehicles entering the station

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