

NFPA[®]

853

Standard for the
Installation of Stationary Fuel Cell
Power Systems

2020



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NFPA® 853

Standard for the

Installation of Stationary Fuel Cell Power Systems

2020 Edition

This edition of NFPA 853, *Standard for the Installation of Stationary Fuel Cell Power Systems*, was prepared by the Technical Committee on Electric Generating Plants. It was issued by the Standards Council on November 4, 2019, with an effective date of November 24, 2019, and supersedes all previous editions.

This edition of NFPA 853 was approved as an American National Standard on November 24, 2019.

Origin and Development of NFPA 853

In 1997, the Technical Committee on Electric Generating Plants appointed a Task Group on Fuel Cells to begin work on this document. The Standards Council officially approved the project in January 1998. The Council recognized that fuel cells were becoming a popular means of producing electricity and that there were no installation standards for this technology. NFPA 853 addresses fire protection for siting, fuel supplies and storage, ventilation, and general fire protection requirements.

The scope of the 2003 edition was changed significantly from that of the 2000 edition. The 2000 edition did not cover fuel cells smaller than 50 kW; the 2003 edition covered stationary fuel cell power systems of any size.

The changes to the 2007 edition of NFPA 853 were clarifications of existing requirements. The use of the concept of lower flammable limit was changed to correctly distinguish it from lower explosive limit.

The changes to the 2010 edition of NFPA 853 included clarification on the distance that is required between fuel cell power system(s) and stored combustible materials. In addition, several clarifications of existing requirements were made.

The changes to the 2015 edition of NFPA 853 include clarification of ventilation air and its application. Chapter 7 was subdivided into three categories: circulation air, dilution air, and primary air. New definitions were also provided.

The changes to the 2020 edition of NFPA 853 address the expanded scope of ANSI/CSA FC 1, *Fuel cell technologies — Part 3-100: Stationary fuel cell power systems — Safety*, both of which now include all pre-engineered and matched modular systems. Sections that allowed alternate compliance options for systems outside the scope of ANSI/CSA FC 1 are no longer needed and have been removed.

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Committee Scope: This Committee shall have primary responsibility for documents on fire protection for electric generating plants and high voltage direct current (HVDC) converter stations, except for electric generating plants using nuclear fuel.

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NFPA 853

Standard for the

Installation of Stationary Fuel Cell Power Systems

2020 Edition

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Information on referenced and extracted publications can be found in Chapter 2 and Annex C.

Chapter 1 Administration

1.1 Scope.

1.1.1 This standard shall apply to the design, construction, and installation of stationary fuel cell power systems.

1.1.2 The scope of this document shall include the following:

- (1) A singular prepackaged, self-contained power system unit
- (2) Any combination of prepackaged, self-contained power system units
- (3) Power system units comprising two or more factory-matched modular components intended to be assembled in the field
- (4) Engineered and field-constructed power systems that employ fuel cells

1.2 Purpose. This document shall provide fire prevention and fire protection requirements for safeguarding life and physical property associated with buildings or facilities that employ stationary fuel cell power systems. This standard shall apply to stationary fuel cells of all sizes.

1.3 Application. This standard shall not apply to portable fuel cells or to fuel cell power systems that are used on any movable structure or vehicle unless the structure or vehicle is made stationary.

1.4 Retroactivity. The provisions of this standard reflect a consensus of what is necessary to provide an acceptable degree of protection from the hazards addressed in this standard at the time the standard was issued.

1.4.1 Unless otherwise specified, the provisions of this standard shall not apply to facilities, equipment, structures, or installations that existed or were approved for construction or installation prior to the effective date of the standard. Where specified, the provisions of this standard shall be retroactive.

1.4.2 In those cases where the authority having jurisdiction determines that the existing situation presents an unacceptable degree of risk, the authority having jurisdiction shall be permitted to apply retroactively any portions of this standard deemed appropriate.

1.4.3 The retroactive requirements of this standard shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, and only where it is clearly evident that a reasonable degree of safety is provided.

1.5 Equivalency. Nothing in this standard is intended to prevent the use of systems, methods, or devices of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety over those prescribed by this standard.

1.5.1 Technical documentation shall be submitted to the authority having jurisdiction to demonstrate equivalency.

1.5.2 The system, method, or device shall be approved for the intended purpose by the authority having jurisdiction.

1.6 Units and Formulas.

1.6.1 The units of measure in this standard are presented in the International System (SI) of Units. Where presented, U.S. customary (inch-pound) units follow the SI units in parentheses.

1.6.2 Where both systems of units are presented, either system shall be acceptable for satisfying the requirements of this standard.

1.6.3 Where both systems of units are presented, users of this standard shall apply one set of units consistently and shall not alternate between units.

1.6.4 The values presented for measurements in this standard are expressed with a degree of precision appropriate for practical application or enforcement. It is not intended that the application or enforcement of these values be more precise than the precision expressed.

1.6.5 Where extracted text contains values expressed in only one system of units, the values in the extracted text have been retained without conversion to preserve the values established by the responsible technical committee in the source document.