

# NFPA<sup>®</sup>

# 111

---

## Standard on Stored Electrical Energy Emergency and Standby Power Systems

---

## 2019



This is a preview. [Click here to purchase the full publication.](#)

## IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

### NOTICE AND DISCLAIMER OF LIABILITY CONCERNING THE USE OF NFPA STANDARDS

NFPA® codes, standards, recommended practices, and guides (“NFPA Standards”), of which the document contained herein is one, are developed through a consensus standards development process approved by the American National Standards Institute. This process brings together volunteers representing varied viewpoints and interests to achieve consensus on fire and other safety issues. While the NFPA administers the process and establishes rules to promote fairness in the development of consensus, it does not independently test, evaluate, or verify the accuracy of any information or the soundness of any judgments contained in NFPA Standards.

The NFPA disclaims liability for any personal injury, property, or other damages of any nature whatsoever, whether special, indirect, consequential or compensatory, directly or indirectly resulting from the publication, use of, or reliance on NFPA Standards. The NFPA also makes no guaranty or warranty as to the accuracy or completeness of any information published herein.

In issuing and making NFPA Standards available, the NFPA is not undertaking to render professional or other services for or on behalf of any person or entity. Nor is the NFPA undertaking to perform any duty owed by any person or entity to someone else. Anyone using this document should rely on his or her own independent judgment or, as appropriate, seek the advice of a competent professional in determining the exercise of reasonable care in any given circumstances.

The NFPA has no power, nor does it undertake, to police or enforce compliance with the contents of NFPA Standards. Nor does the NFPA list, certify, test, or inspect products, designs, or installations for compliance with this document. Any certification or other statement of compliance with the requirements of this document shall not be attributable to the NFPA and is solely the responsibility of the certifier or maker of the statement.

### REVISION SYMBOLS IDENTIFYING CHANGES FROM THE PREVIOUS EDITION

Text revisions are shaded. A **Δ** before a section number indicates that words within that section were deleted and a **Δ** to the left of a table or figure number indicates a revision to an existing table or figure. When a chapter was heavily revised, the entire chapter is marked throughout with the **Δ** symbol. Where one or more sections were deleted, a **•** is placed between the remaining sections. Chapters, annexes, sections, figures, and tables that are new are indicated with an **N**.

Note that these indicators are a guide. Rearrangement of sections may not be captured in the markup, but users can view complete revision details in the First and Second Draft Reports located in the archived revision information section of each code at [www.nfpa.org/docinfo](http://www.nfpa.org/docinfo). Any subsequent changes from the NFPA Technical Meeting, Tentative Interim Amendments, and Errata are also located there.

### REMINDER: UPDATING OF NFPA STANDARDS

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that NFPA Standards may be amended from time to time through the issuance of a Tentative Interim Amendment (TIA) or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any TIAs and Errata then in effect.

To determine whether an NFPA Standard has been amended through the issuance of Tentative Interim Amendments or corrected by Errata, go to [www.nfpa.org/docinfo](http://www.nfpa.org/docinfo) to choose from the list of NFPA Standards or use the search feature to select the NFPA Standard number (e.g., NFPA 13). The document information page provides up-to-date document-specific information as well as postings of all existing TIAs and Errata. It also includes the option to register for an “Alert” feature to receive an automatic email notification when new updates and other information are posted regarding the document.

# IMPORTANT NOTICES AND DISCLAIMERS CONCERNING NFPA® STANDARDS

## ADDITIONAL NOTICES AND DISCLAIMERS

### Updating of NFPA Standards

Users of NFPA codes, standards, recommended practices, and guides (“NFPA Standards”) should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of Tentative Interim Amendments or corrected by Errata. An official NFPA Standard at any point in time consists of the current edition of the document together with any Tentative Interim Amendments and any Errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of Tentative Interim Amendments or corrected through the issuance of Errata, consult appropriate NFPA publications such as the National Fire Codes® Subscription Service, visit the NFPA website at [www.nfpa.org](http://www.nfpa.org), or contact the NFPA at the address listed below.

### Interpretations of NFPA Standards

A statement, written or oral, that is not processed in accordance with Section 6 of the Regulations Governing the Development of NFPA Standards shall not be considered the official position of NFPA or any of its Committees and shall not be considered to be, nor be relied upon as, a Formal Interpretation.

### Patents

The NFPA does not take any position with respect to the validity of any patent rights referenced in, related to, or asserted in connection with an NFPA Standard. The users of NFPA Standards bear the sole responsibility for determining the validity of any such patent rights, as well as the risk of infringement of such rights, and the NFPA disclaims liability for the infringement of any patent resulting from the use of or reliance on NFPA Standards.

NFPA adheres to the policy of the American National Standards Institute (ANSI) regarding the inclusion of patents in American National Standards (“the ANSI Patent Policy”), and hereby gives the following notice pursuant to that policy:

NOTICE: The user’s attention is called to the possibility that compliance with an NFPA Standard may require use of an invention covered by patent rights. NFPA takes no position as to the validity of any such patent rights or as to whether such patent rights constitute or include essential patent claims under the ANSI Patent Policy. If, in connection with the ANSI Patent Policy, a patent holder has filed a statement of willingness to grant licenses under these rights on reasonable and nondiscriminatory terms and conditions to applicants desiring to obtain such a license, copies of such filed statements can be obtained, on request, from NFPA. For further information, contact the NFPA at the address listed below.

### Law and Regulations

Users of NFPA Standards should consult applicable federal, state, and local laws and regulations. NFPA does not, by the publication of its codes, standards, recommended practices, and guides, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

### Copyrights

NFPA Standards are copyrighted. They are made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of safe practices and methods. By making these documents available for use and adoption by public authorities and private users, the NFPA does not waive any rights in copyright to these documents.

Use of NFPA Standards for regulatory purposes should be accomplished through adoption by reference. The term “adoption by reference” means the citing of title, edition, and publishing information only. Any deletions, additions, and changes desired by the adopting authority should be noted separately in the adopting instrument. In order to assist NFPA in following the uses made of its documents, adopting authorities are requested to notify the NFPA (Attention: Secretary, Standards Council) in writing of such use. For technical assistance and questions concerning adoption of NFPA Standards, contact NFPA at the address below.

### For Further Information

All questions or other communications relating to NFPA Standards and all requests for information on NFPA procedures governing its codes and standards development process, including information on the procedures for requesting Formal Interpretations, for proposing Tentative Interim Amendments, and for proposing revisions to NFPA standards during regular revision cycles, should be sent to NFPA headquarters, addressed to the attention of the Secretary, Standards Council, NFPA, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101; email: [stds\\_admin@nfpa.org](mailto:stds_admin@nfpa.org).

For more information about NFPA, visit the NFPA website at [www.nfpa.org](http://www.nfpa.org). All NFPA codes and standards can be viewed at no cost at [www.nfpa.org/docinfo](http://www.nfpa.org/docinfo).

Copyright © 2018 National Fire Protection Association®. All Rights Reserved.

## NFPA® 111

### Standard on

## Stored Electrical Energy Emergency and Standby Power Systems

### 2019 Edition

This edition of NFPA 111, *Standard on Stored Electrical Energy Emergency and Standby Power Systems*, was prepared by the Technical Committee on Emergency Power Supplies and released by the Correlating Committee on National Electrical Code®. It was issued by the Standards Council on December 24, 2017, with an effective date of January 13, 2018, and supersedes all previous editions.

This edition of NFPA 111 was approved as an American National Standard on January 13, 2018.

### Origin and Development of NFPA 111

The Technical Committee on Emergency Power Supplies was organized in 1976 by NFPA in recognition of the demand for guidelines on the assembly, installation, and performance of electrical power systems to supply critical and essential needs during outages of the normal power source. During the development of a base standard (NFPA 110, *Standard for Emergency and Standby Power Systems*), it was determined that several power sources were available for emergency and standby power systems. The committee determined that sufficient differences existed between these sources to justify separate documents providing clearly defined specifics. Each document would follow the basic format of NFPA 110 to provide a consistent basis for comparison and usage and would remain under the jurisdiction of the Technical Committee on Emergency Power Supplies.

Because of the unique knowledge necessary to provide an authoritative document, the technical committee authorized a subcommittee in 1982 to prepare a draft document on systems using stored energy sources. In 1986, a document tentatively titled NFPA 110A, *Stored Energy Emergency and Standby Power Systems*, was submitted for adoption at the 1989 NFPA Annual Meeting.

Formally designated as NFPA 111, this document addressed the performance of stored energy systems with appropriate equipment detail. The requirements of the standard were considered necessary to obtain the minimum level of reliability and performance and to achieve an on-site stored energy auxiliary electrical power source suitable to the needs of the applicable requirements. If followed, its use would result in a system suitable for various situations as required by other codes and standards.

The second edition in 1993 contained only minor changes.

For the 1996 edition, a section was added to cover the acceptability of systems, methods, and devices other than those listed in the document.

The 2001 edition contained two changes: informational text was moved to the appendix, and the operational testing requirements were expanded.

The 2005 edition underwent a complete rewrite in accordance with the *Manual of Style for NFPA Technical Committee Documents*. Along with the rewrite, some of the definitions were revised and located in Chapter 3. Other data in the document were transferred to the table format for better usability.

The 2010 edition revised the document scope to clarify that an uninterruptible power supply (UPS) supplied through an emergency power supply (EPS) is not a stored emergency power supply system (SEPPS). The definitions of *automatic transfer switch* and *nonautomatic transfer switch* were revised to correlate with NFPA 110. New definitions covered battery cell types, bridging systems, and electrochemical energy storage devices. Energy sources, convertors, inverters, and accessories were covered by Chapter 5 revisions that clarified existing requirements, recognized new battery types, and provided requirements covering stored energy sources other than batteries. Revisions to area ventilation requirements acknowledged that there might be flammable gases other than hydrogen