**NATIONAL FIRE PROTECTION ASSOCIATION**
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# MEMORANDUM

**TO:** Technical Committee on Special Equipment, Processes and Hazardous Materials

**FROM:** Joe Yee, *Committee Administrator*

**DATE:** May 19, 2023

**SUBJECT:** NFPA 1 Proposed Tentative Interim Amendment (TIA) No. 1711

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The attached proposed Tentative Interim Amendment (TIA) Log No. 1711 is being submitted to you for ballot to revise NFPA 855 extracts 2.4, 3.3.104, A.3.3.104, various paragraphs in Chapter 52, and F.3. This proposed TIA was submitted by Robert Davidson of Davidson Code Concepts, LLC and we have received written agreement to the processing of the submitted TIA from Michael Snyder of Dekra Process Safety.

This proposed TIA will be published for public comment in the May/June 2023 issue of *NFPA News* with a Public Comment Closing Date of July 12, 2023. Any public comments received will be circulated to the committee. Finally, the Standards Council will review and consider the issuance of this TIA.

In accordance with Section 5 of the *Regulations Governing the Development of NFPA Standards,* you are being balloted on the technical merits of the proposed TIA and whether this matter is of an emergency nature.

The ballot can now be accessed through the NFPA online ballot system at the following link: NFPA Ballot Link**.** The link will bring you to your profile page and once you sign in, select the My Committees tab and click on the blue Vote button which will direct you to the ballot site.

Please complete the ballot on or before **June 2, 2023, 11:59 pm ET.**

While completing your ballot, please remember the following:

- **A comment is required for both Question No. 1 and Question No. 2 for the online TIA ballot. Comments must accompany all Negative, Abstaining and Agree votes.**
- **If you vote "Agree" on Question 1, simply add "Agree" to the comment field and if you vote "Agree" on Question 2, insert the applicable letter(s) selections in the comment field which can be found in the Instructions box on the ballot site.**

You must hit SUBMIT to SAVE your work**.** **Note**: the system session will time you out after 45 minutes; any work not submitted at that time will not be saved! You may return to finish or change your ballot at any time up to the closing date. Ballot comments exceeding 4,000 characters must be submitted in a Word document via email, to Joe Yee at jyee@nfpa.org.

*Note: Please remember that the return of ballots and attendance at committee meetings are required in accordance with the Regulations Governing the Development of NFPA Standards.*

**NFPA 1-Proposed 2024 Edition**
***Fire Code***
**TIA Log No.: 1711**
**Reference:** (NFPA 855 extracts) 2.4, 3.3.104, A.3.3.104, various paragraphs in Chapter 52, and F.3
**Comment Closing Date: July 12, 2023**
**Submitter:** Robert Davidson, Davidson Code Concepts, LLC
www.nfpa.org/1

*1. Revise paragraph 2.4 to read as follows:*

**2.4 References for Extracts in Mandatory Sections.**

…

NFPA 855, *Standard for the Installation of Stationary Energy Storage System*s, ~~2020~~2023 edition.

…

*2. Revise paragraph 3.3.104 and associated Annex A.3.3.104 to read as follows:*

**3.3.104* Energy Storage Systems (ESS).** One or more devices, assembled together, capable of storing energy ~~in order~~ to supply electrical energy at a future time ~~to the local power loads, to the utility grid, or for grid support~~. [**855,** ~~2020~~2023]

**A.3.3.104 Energy Storage Systems (ESS).**

ESS include, but are not limited to, the following categories:

(1) Chemical: hydrogen storage
(2) Thermal: thermal energy storage
(3) Electrochemical:
  (a) Batteries
  (b) Flow batteries
(4) Mechanical:
  (a) Flywheel
  (b) Pumped hydro
  (c) Compressed air energy storage (CAES)
(5) Electrical:
  (a) Capacitors
  (b) Superconducting magnetic energy storage (SMES)

These systems can have ac or dc output for utilization and can include inverters and converters to change stored energy into electrical energy. It is not the intention for ESS to include energy generation systems.

Energy storage systems can include, but are not limited to, batteries, capacitors, and kinetic energy devices (e.g., flywheels). Energy storage systems can include inverters or converters to change voltage levels or to make a change between an ac or a dc system. These systems differ from other storage systems such as a UPS system, which is a power supply used to provide alternating current power to a load for some period of time in the event of a power failure.

[**855,** ~~2020~~2023]

*3. Revise the following paragraphs in Chapter 52 and any associated Annex material to read as follows:*

**52.1.4 Documentation Location.** A copy of the operations and maintenance manual shall be placed in an approved location to be accessible to AHJs and emergency responders.

[**855:**4.~~1.~~2.3.2]
**52.1.5 Emergency Operations Plan.** An emergency operations plan shall be readily available for use by facility operations and maintenance personnel. [**855:**4.~~1.~~3.2.1]
**52.1.6.1 Commissioning Plan.** A commissioning plan meeting the provisions of Chapter 6 in NFPA 855 shall be provided to the building owner or their authorized agent and the AHJ. [**855:**4.~~1.~~2.4]
**52.1.6.3** The AHJ shall be notified prior to decommissioning an ESS. [**855:**8.2.1]
**52.1.11.1** Combustible materials not related to the ESS shall not be stored in dedicated rooms, cabinets, or enclosures containing ESS equipment. [**855:**4.5.1~~.6.1~~]
**52.1.11.2** Combustible materials related to the ESS shall not be stored within 3 ft (~~914~~ 0.9 m~~m~~) from ESS equipment. [**855:**4.5~~1.6~~.2]
**52.1.11.3** Combustible materials in occupied work centers shall comply with Section 10.19 or other applicable fire codes. [**855:**4.~~1.6~~5.~~3~~4]
**52.1.12 Equipment.**
**52.1.12.1 Repairs.** Repairs of ESS shall only be ~~done~~ performed by qualified persons and documented in the maintenance, testing, and events log required in 4.~~1.~~2.3 of NFPA 855. [**855:**4.~~2~~6.2.1]
**52.1.12.2 Retrofits.**
**52.1.12.2.1** Retrofit~~sting~~ of ESS shall be approved and comply with the following unless modified in other sections:

(1) Battery systems and modules and capacitor systems and modules shall be listed in accordance with UL 1973 and installed in accordance with the manufacturer's instructions.
(2) ~~Battery~~ ESS management and other monitoring systems shall be connected and installed in accordance with the manufacturer's instructions.
(3) The overall installation shall continue to comply with UL 9540 listing requirements, where applicable.
(4) Retrofits shall be documented in the maintenance, testing, and events log required in 4.~~1.~~2.3 of NFPA 855.

[**855:**4.~~2~~6.3.1]
**52.1.12.2.2** Changing out or retrofitting existing lead-acid or nickel-cadmium batteries~~y systems with other lead-acid or nickel-cadmium battery systems less than 50 V ac, 60 V dc in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations that are in compliance with NFPA 76~~ shall be considered repairs when there is no increase in system size or capacity greater than 10 percent from the original design. [**855:**4.~~2~~6.3.2]
**52.1.12.2.3*** ~~Changing out or retrofitting existing l~~Lead-acid ~~or~~ and nickel-cadmium battery systems ~~with other lead-acid or nickel-cadmium battery systems~~ that are ~~designed in accordance with IEEE C2,~~ used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility~~,~~ and located outdoors or in building spaces used exclusively for such installations ~~shall be considered repairs when there is no increase in system size or capacity greater than 10 percent from the original design.~~ [**855:**4.~~2.3~~7.7.3(2)]

**A.52.1.12.2.3** This ~~subsection~~ is in line with the scope of 90.2(~~B~~D)(5) of *NFPA 70* and applies to lead-acid or nickel-cadmium batteries. [**855:**A.4.~~2.3~~7.7.3(2)~~3~~]

**52.1.12.2.4** ~~Changing out or retrofitting existing l~~Lead-acid and nickel-cadmium battery systems ~~with other lead-acid battery systems~~ in uninterruptable power supplies listed and labeled in accordance with UL 1778 and ~~utilized~~ used ~~for~~ in standby power applications shall

not be ~~considered repairs where there is no increase in system size or capacity greater than 10 percent from the original design~~required to comply with 9.2.3.1 through 9.2.3.3 of NFPA 855. [**855:**~~4~~9.2.3.4.3]

**52.1.12.3 Replacements.** Replacement of ESS shall be considered new ESS installations and comply with the provisions applicable to new ESS. [**855:**4.~~2~~6.4.1]

**52.1.13 Increase in Power Rating or Maximum Stored Energy.**

**52.1.13.1** A complete new ESS that is added to an existing installation of one or more ~~existing~~ systems ~~(including traditional standby systems)~~ shall be treated as a new system and meet the applicable requirements of this ~~standard~~code. [**855:**4.~~2.5~~6.6.1]

**52.1.13.2** An increase in maximum stored energy or power rating to an existing ESS shall be considered a retrofit and comply with 52.1.12.2~~1.2.1~~. [**855:**4.6.6.2.~~5.2~~]

**52.1.14* Electrical Installation.** The electrical installation shall be in accordance with *NFPA 70* or IEEE C2 based on the location of the ESS in relation to and its interaction with the electrical grid. [**855:**4.7.1]

**A.52.1.14** Installations of communications equipment, including batteries, under the exclusive control of communications utilities located outdoors or in building spaces used exclusively for such installations are not covered by *NFPA 70* and need not comply with the requirements of *NFPA 70*.

Adequate working space is vital for electrical safety-related work practices. Articles 110 and 706 of *NFPA 70* provide working space requirements for electrical equipment. NECA 416 is another installation standard that provides guidelines for working space requirements. [**855:**A.4.7.1]

**52.1.~~14~~ 15 Environment.** The temperature, humidity, and other environmental conditions in which an ESS is located shall be maintained in accordance with the listing ~~(if listed)~~ and the manufacturer's specifications. [**855:**4.~~2~~.6.7]

~~**52.1.15* Working Space.** At a minimum, ESS equipment shall be provided with working space in accordance with NFPA 70 or IEEE C2, as appropriate, for operation, inspection, troubleshooting, maintenance, or replacement. [**855:**4.3.2]~~

~~**A.52.1.15** Adequate working space is vital for electrical safety related work practices. Articles 110 and 706 of *NFPA 70* provide working space requirements for electrical equipment. NECA 416 is another installation standard that provides guidelines for working space requirements. [**855:**A.4.3.2]~~

**52.1.16 Security of Installations.**

**52.1.16.1** ESS shall be secured against unauthorized entry and safeguarded in an approved manner. [**855:**4.7.6.1~~3.8.1~~]

**52.1.16.2** Security barriers, fences, landscaping, and other enclosures shall not inhibit the required air flow to or exhaust from the ESS and its components. [**855:**4.7.6.2~~3.8.2~~]

**52.1.17 Fire Command Centers.** In buildings containing ESS and equipped with a fire command center, the command center shall include signage or readily available documentation that describes the location and type of ESS, operating voltages, and location of electrical disconnects as required by *NFPA 70*. [**855:**4.7.10~~3.12~~]

**52.1.18 Reused ~~or Repurposed~~ Equipment.** Materials, equipment, and devices shall not be reused or reinstalled unless such elements have been reconditioned, tested, and placed in good and proper working condition and approved. ~~Storage batteries previously used in other applications, such as electric vehicle propulsion, shall not be permitted unless the equipment is repurposed by a UL 1974 compliant battery repurposing company when reused in ESS applications and the system complies with 4.2.1 of NFPA 855.~~ [**855:**4.6.5~~2.10.1~~]

**52.1.19 Signage.**

**52.1.19.1** Approved signage shall be provided in the following locations:

(1) On the front doors to rooms or areas containing ESS or in approved locations near entrances to ESS rooms
(2) On the front doors to outdoor occupiable ESS containers
(3) In approved locations on outdoor ESS that are not enclosed in occupiable containers or otherwise enclosed

[**855:**4.7.4.1~~3.5.1~~]

**52.1.19.2*** The signage required in 52.1.19.1 shall be in compliance with ANSI Z535 and include the following information as shown in Figure 52.1.19.2~~:~~.

(1) "Energy Storage Systems" with symbol of lightning bolt in a triangle
(2) Type of technology associated with the ESS
(3) Special hazards associated as identified in Chapters 9 through 15 of NFPA 855
(4) Type of suppression system installed in the area of the ESS
(5) Emergency contact information

[**855:**4.7.4.~~3.5.~~2]

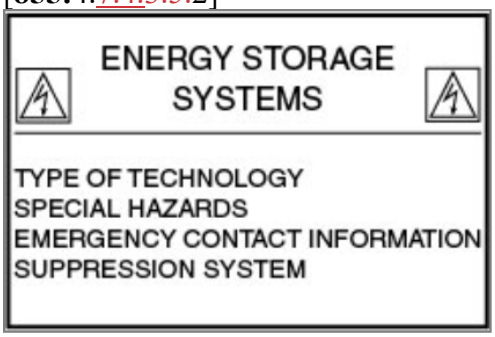


**Figure 52.1.19.2 Example of ESS Signage. [855:Figure 4.~~3.5~~7.4.2]**

**A.52.1.19.2** This sign can be broken into multiple segments. An example of this would be if the manufacturer provides their own separate signage about the fire suppression system. [**855:**A.4.7.4.~~3.5.~~2]

**52.1.20 Impact Protection.**

**52.1.20.1** ESS shall be located or protected to prevent physical damage from impact where such risks are identified. [**855:**4.~~3~~7.5.1~~.7.1~~]

**52.1.20.2** Vehicle impact protection consisting of guard posts or other approved means shall be provided where ESS are subject to impact by motor vehicles. [**855:**4.7.5.2~~3.7.2~~]

**52.1.21 Means of Egress.**

**52.1.21.1** All areas containing ESS shall provide egress from the area in which they are located in accordance with the local building code. [**855:**4.7.8.1~~3.10.1~~]

**52.1.21.2** Required egress doors shall be provided with emergency lighting as required by the local building code. [**855:**4.7.8.2~~3.10.2~~]

**52.1.22 Spill Control.** Rooms, buildings, or areas containing ESS with free-flowing liquid electrolyte in individual vessels having a capacity of more than 55 gal (208 L) or multiple vessels having an aggregate capacity exceeding 1000 gal (3785 L) shall be provided with spill control to prevent the flow of liquids to adjoining areas. [**855:**9.6.5.2.1~~4.14.1~~]

**52.2.1 Hazard Support Personnel.** Where required by the AHJ for public safety, the owner or their authorized agent shall provide hazard support personnel at the owner's expense.~~When, in the opinion of the AHJ, it is essential for public safety that trained personnel be on site to respond to possible ignition or reignition of a damaged or decommissioned ESS, the owner, agent, or lessee shall provide one or more fire mitigation personnel, as required and approved, at their expense.~~ [**855:**9.6.6.2~~4.16.2.1~~]

**52.2.2*** Required hazard support personnel shall monitor the ESS continuously in a method approved by the AHJ from the time the fire department releases the emergency scene until the

hazard is mitigated and the AHJ gives authorization to the owner or their authorized agent that onsite hazard support personnel are no longer required. ~~These personnel shall remain on duty continuously after the fire department leaves the premises until the damaged ESS is removed from the premises or the AHJ indicates they can leave.~~ [**855:**9.6.6.2.4~~4.16.2.2~~]

**A.52.2.2** Based on the system design and features, remote monitoring and controls that provide additional safety benefits can be used by the AHJ to determine the level of onsite monitoring required. [**855:**A.9.6.6.2.4]

**52.2.3*** On-duty hazard support ~~fire mitigation~~ personnel shall have the following responsibilities:

(1) Ensure the security and safety of the ESS site in accordance with the emergency operation plan and decommissioning plan

(2) Keep diligent watch for fires or signs of off-gassing, obstructions to means of egress, and other hazards for the time required in accordance with 9.6.6.2.4 of NFPA 855

(3) Ensure a means of communication is available to immediately contact the fire department if their assistance is needed to mitigate any hazards

(4) Take prompt measures for remediation of hazards

(5) Take prompt measures to assist in the evacuation of the public from the structures in accordance with the emergency operations plan

(6) Allow only authorized personnel to enter the ESS site

(7) Ensure authorized personnel are wearing proper PPE

(8) Where required by the AHJ, maintain a written or electronic log of all personnel entering/leaving the portion of the site containing the ESS

(9) Record all postincident tasks performed

~~(1) Keep diligent watch for fires, obstructions to means of egress, and other hazards~~

~~(2) Immediately contact the fire department if their assistance is needed to mitigate any hazards~~

~~(3) Take prompt measures for remediation of hazards and extinguishment of fires that occur~~

~~(4) Take prompt measures to assist in the evacuation of the public from the structures~~

[**855:**9.6.6.2.5~~4.16.2.3~~]

**A.52.2.3** Hazard support personnel should be able to provide support to the AHJ in reoccupying the space, implementing the decommissioning plan, and deenergizing the battery modules for a safe means of transportation.

Hazard support personnel are not expected to perform any fire suppression duties but can do so if properly trained and equipped. [**855:**A.9.6.6.2.5]

**52.1.23* Exhaust Ventilation During Normal Operation.** Where required by Table 9.6.5 of NFPA 855 or elsewhere in this standard, exhaust ventilation during normal operation shall be provided for rooms, enclosures, walk-in units, and cabinets as follows:

(1) ESS rooms and walk-in units shall use mechanical exhaust ventilation in accordance with 9.6.5.1.5 of NFPA 855.

(2) Outdoor ESS cabinets shall use either mechanical or natural exhaust ventilation in accordance with 9.6.5.1.4 or 9.6.5.1.5 of NFPA 855.

[**855:**9.6.5.1]

**A.52.1.23** This section addresses hazards associated with the release of flammable gases from ESS during normal charging, discharging, and use conditions. Similar requirements have been in fire codes for many years primarily to address off-gassing of hydrogen from stationary vented lead-acid battery systems but not limited to that technology. [**855:**A.9.6.5.1]

This section is not intended to provide protection against the release of flammable gases during abnormal charging or thermal runaway conditions. Those conditions are addressed in 9.6.5.6 of NFPA 855. In addition, this section does not regulate ventilation of toxic and

highly toxic gases, which are regulated by 4.6.11 of NFPA 855. [**855:**A.9.6.5.1]

~~**A.52.1.24** This section addresses hazards associated with the release of flammable gases from ESS during normal charging, discharging, and use conditions. Similar requirements have been in fire codes for many years primarily to address off gassing of hydrogen from stationary vented lead-acid battery systems but not limited to that technology. This section is not intended to provide protection against the release of flammable gases during abnormal charging or thermal runaway conditions. Those conditions are addressed in Section 4.12 of NFPA 855. In addition, this section does not regulate ventilation of toxic and highly toxic gases, which are regulated by 4.1.1 of NFPA 855. [**855:**A.4.9]~~

~~**A.52.3** Installations of communications equipment under the exclusive control of utilities located outdoors or in buildings used exclusively for such installations are outside the scope of *NFPA 70* and are not addressed in Section 5.1 of NFPA 855. [**855:**A.5.1]~~

*4. Revise Annex F.3 to read as follows:*

**F.3 References for Extracts in Informational Sections.**

…

NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems,* 2023 edition.

…

**Substantiation:** NFPA documents are updated to the most current edition to comply with the NFPA Extract Policy. The current text of NFPA 1 contains extracts from the 2020 edition of NFPA 855 but the second draft report for the 2023 edition has been published. This TIA updates the extracted language and makes other adjustments as necessary for the changes to the updated extract text. For technical substantiation on any changes, see the first and second draft reports for the source document.

**Emergency Nature:** The standard contains an error or an omission that was overlooked during the regular revision process.

The second draft report was not available at the time of the NFPA 1 second draft meeting. Therefore, to ensure accuracy in extracted material, the updates were done after the second draft report for the source document was posted. By waiting to update the extracts the final product in NFPA 1 will be more closely aligned to what is in the source document and ensures the most up to date information is contained in NFPA 1.

# TENTATIVE INTERIM AMENDMENT BALLOT

## EMERGENCY NATURE SELECTION OF RESPONSES

**A.** The standard contains an error or an omission that was overlooked during the regular revision process.

**B.** The NFPA Standard contains a conflict within the NFPA Standard or with another NFPA Standard.

**C.** The proposed TIA intends to correct a previously unknown existing hazard.

**D.** The proposed TIA intends to offer to the public a benefit that would lessen a recognized (known) hazard or ameliorate a continuing dangerous condition or situation.

**E.** The proposed TIA intends to accomplish a recognition of an advance in the art of safeguarding property or life where an alternative method is not in current use or is unavailable to the public.

**F.** The proposed TIA intends to correct a circumstance in which the revised NFPA Standard has resulted in an adverse impact on a product or method that was inadvertently overlooked in the total revision process or was without adequate technical (safety) justification for the action.