



NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

**National Electrical Code® Correlating Committee
NFPA 110 and NFPA 111 First Draft Meeting Agenda
December 18, 2019
Telephone/Web Conference**

<u>Item No.</u>	<u>Subject</u>
19-12-1	Call to order and introduction of members and guests (Attachment A)
19-12-2	Review of NFPA 110 and 111 First Draft and task group recommendations (Attachment B)
19-12-3	Future Meeting a. March 2 – 3, 2020 Correlating Committee Planning Meeting
19-12-4	New Business
19-12-5	Adjournment

Attachment A: Correlating Committee Roster

Address List No Phone

12/16/2019
Jeffrey S. Sargent
NEC-AAC

National Electrical Code®

Lawrence S. Ayer	IM 8/5/2009	James E. Brunssen	UT 4/1/1996
Chair Biz Com Electric, Inc. 2867 Stanton Avenue Cincinnati, OH 45206 Independent Electrical Contractors, Inc. Alternate: David L. Hittinger	NEC-AAC	Principal Telcordia Technologies (Ericsson) 11 Ashwood Place Parsippany, NJ 07054-2213 Alliance for Telecommunications Industry Solutions Alternate: Ernest J. Gallo	NEC-AAC
Kevin L. Dressman	U 08/17/2015	Palmer L. Hickman	L 10/23/2003
Principal US Department of Energy 19901 Germantown Road Germantown, MD 20874-1207	NEC-AAC	Principal Electrical Training Alliance 5001 Howerton Way, Suite N Bowie, MD 20715-4459 International Brotherhood of Electrical Workers	NEC-AAC
Richard A. Holub	U 08/11/2014	Michael J. Johnston	IM 8/2/2010
Principal The DuPont Company, Inc. DuPont Engineering 974 Center Road, CRP 723/ 2099 PO Box 2915 Wilmington, DE 19805 American Chemistry Council	NEC-AAC	Principal National Electrical Contractors Association 3 Bethesda Metro Center, Suite 1100 Bethesda, MD 20814-5372 Alternate: Timothy James Schultheis	NEC-AAC
John R. Kovacik	RT 1/15/1999	Alan Manche	M 08/09/2012
Principal UL LLC 333 Pfingsten Road Northbrook, IL 60062-2096 Alternate: Robert D. Osborne	NEC-AAC	Principal Schneider Electric 1601 Mercer Road Lexington, KY 40511-1025	NEC-AAC
Roger D. McDaniel	UT 04/04/2017	George A. Straniero	M 08/11/2014
Principal Georgia Power Company Power Quality Principal 180 Dam Road Jackson, GA 30233 Electric Light & Power Group/EEI Alternate: Roland E. Deike, Jr.	NEC-AAC	Principal AFC Cable Systems, Inc. 106 Village Center Drive Freehold, NJ 07728-2510 National Electrical Manufacturers Association Alternate: David H. Kendall	NEC-AAC
David A. Williams	E 04/04/2017	Christine T. Porter	RT 08/11/2014
Principal Delta Charter Township 1422 Lindy Drive Lansing, MI 48917 International Association of Electrical Inspectors Alternate: Robert A. McCullough	NEC-AAC	Voting Alternate Intertek Testing Services 702 North 86th Street Seattle, WA 98103-3830	NEC-AAC

Address List No Phone

12/16/2019
Jeffrey S. Sargent
NEC-AAC

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Roland E. Deike, Jr.	UT 04/08/2015	Ernest J. Gallo	UT 5/30/2008
Alternate CenterPoint Energy, Inc. PO Box 1700 Houston, TX 77251-1700 Electric Light & Power Group/EEI Principal: Roger D. McDaniel	NEC-AAC	Alternate Telcordia Technologies (Ericsson) One Centennial Drive Piscataway, NJ 08854 Alliance for Telecommunications Industry Solutions Principal: James E. Brunssen	NEC-AAC
David L. Hittinger	IM 11/2/2006	David H. Kendall	M 08/08/2019
Alternate Independent Electrical Contractors of Greater Cincinnati 586 Kings Run Drive Cincinnati, OH 45232-1606 Independent Electrical Contractors, Inc. Principal: Lawrence S. Ayer	NEC-AAC	Alternate ABB Inc. 860 Ridge Lake Boulevard Memphis, TN 38120 National Electrical Manufacturers Association Principal: George A. Straniero	NEC-AAC
Robert A. McCullough	E 10/20/2010	Robert D. Osborne	RT 08/17/2017
Alternate 141 Clay Street Tuckerton, NJ 08087-2611 International Association of Electrical Inspectors Principal: David A. Williams	NEC-AAC	Alternate UL LLC 12 Laboratory Drive Research Triangle Park, NC 27709-3995 Principal: John R. Kovacik	NEC-AAC
Timothy James Schultheis	IM 04/03/2019	Timothy J. Pope	SE 10/18/2011
Alternate T.S.B Inc., Schultheis Electric 304 Sanford Street PO Box 798 Latrobe, PA 15650 National Electrical Contractors Association Principal: Michael J. Johnston	NEC-AAC	Nonvoting Member Canadian Standards Association 178 Rexdale Boulevard Toronto, ON M9W 1R3 Canada CSA/Canadian Electrical Code Committee	NEC-AAC
William R. Drake	M 1/1/1988	D. Harold Ware	IM 4/1/1993
Member Emeritus 4464 Green Valley Road Fairfield, CA 94534-1362	NEC-AAC	Member Emeritus Libra Electric Company 4736 Enterprise Drive Oklahoma City, OK 73128	NEC-AAC
Jeffrey S. Sargent	08/31/2019		
Staff Liaison National Fire Protection Association One Batterymarch Park Quincy, MA 02169-7471	NEC-AAC		

Attachment B: Review of NFPA 110 and 111 First Draft



NATIONAL FIRE PROTECTION ASSOCIATION

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M E M O R A N D U M

TO: Technical Committee on Emergency Power Supplies

FROM: Sarah Caldwell, *Technical Committee Administrator*

DATE: November 14, 2019

SUBJECT: NFPA 110 First Draft Technical Committee FINAL Ballot Results (A2021)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

27 Members Eligible to Vote

7 Members Not Returned (*Cotton, Dagenais, Hunt, Kowalskij, Loomis, Skiba, Works*)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for each revision.

To pass ballot, each revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of $\frac{2}{3}$ of ballots returned. See Sections 3.3.4.3.(c) and 4.3.10.1 of the ***Regulations Governing the Development of NFPA Standards***.

**First Revision No. 25-NFPA 110-2019 [Detail]**

[Revise 8.4.2 as shown below:]

8.4.2*

Generator sets EPSSs in service shall be exercised at least once monthly, for a minimum of 30 minutes, using one of the following methods: in 8.4.2.1.

- ~~(1) Loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer~~
- ~~(2) Under operating temperature conditions and at not less than 30 percent of the EPS standby nameplate kW rating~~

A.8.4.2 [Reassociate to 8.4.2.1.1]

Light loading creates a condition termed *wet stacking*, indicating the presence of unburned fuel or carbon, or both, in the exhaust system. Its presence is readily indicated by the presence of continuous black smoke during engine-run operation. The testing requirements of 8.4.2 are intended to reduce the possibility of wet stacking. If equivalent loads are used for exercising, it is suggested that all essential loads be energized first, with the equivalent load used only to supplement the test. If the normal power were to fail during the exercise period, it would negate the urgency to automatically remove the equivalent load as described in 8.4.2.2.

The generator set manufacturer should be consulted where the nameplate data do not indicate rating type. There is a difference between prime and standby ratings. For example, there are usually two kW nameplate ratings found on most engine-driven generators: “standby” and “prime.” There can be a significant difference between the resulting kW figures when calculating 30 percent of nameplate — for example, a 100 kW standby generator is normally considered an 80 kW set for prime power: $100 \text{ kW} \times 30\% = 30 \text{ kW}$, but $80 \text{ kW} \times 30\% = 24 \text{ kW}$. A permanent record of the rating should be maintained and readily available.

8.4.2.1 Minimum Load Test Requirements.**8.4.2.1.1***

Diesel generators shall be exercised using one of the following methods:

- (1) Loading that maintains the minimum exhaust gas temperatures as recommended by the manufacturer
- (2) Under operating temperature conditions and at not less than 30 percent of the EPS standby nameplate kW rating

8.4.2.1.1.1

A supplemental load bank shall be permitted to be used to meet or exceed the 30 percent requirement.

8.4.2.1.2

For spark-ignited EPSSs, loading shall be the available EPSS load.

Submitter Information Verification

Committee:

Submittal Date: Thu Aug 22 10:15:24 EDT 2019

Committee Statement

Committee Statement: The minimum load test requirements have been restructured to enhance usability. Spark ignited generators do not need to be loaded at 30% since they are not subject to wet stacking.

Response Message: FR-25-NFPA 110-2019

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

There are some punctuation errors in the text that need attention: EPS equipment in service shall be exercised at least once monthly for a minimum of 30 minutes using one of the methods in 8.4.2.1.

**First Revision No. 26-NFPA 110-2019 [Section No. 5.1.1]****5.1.1***

The following energy sources shall be permitted to be used for the emergency power supply (EPS):

- (1)* Liquid petroleum products at atmospheric pressure as specified in the appropriate ASTM standards and as recommended by the engine manufacturer
- (2)* Liquefied petroleum gas (liquid or vapor withdrawal) as specified in the appropriate ASTM standards and as recommended by the engine manufacturer
- (3)* Natural or synthetic gas

Exception: For Level 1 installations in locations where the probability of interruption of off-site fuel supplies is high, on-site storage of an alternate energy source sufficient to allow full output of the EPSS to be delivered for the class specified shall be required, with the provision for automatic transfer from the primary energy source to the alternate energy source.

5.1.1.1

For Level 1 installations in locations where the probability of interruption of off-site fuel supplies is high, on-site storage of an alternate energy source sufficient to allow full output of the EPSS to be delivered for the class specified shall be required, with the provision for automatic transfer from the primary energy source to the alternate energy source.

Supplemental Information

File Name	Description Approved
FR-26_5.1.1_FINAL.docx	for prod use

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Fri Oct 04 14:10:28 EDT 2019

Committee Statement

Committee Statement: The exception is converted to positive language to comply with the Manual of Style.

Response Message: FR-26-NFPA 110-2019

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James
Kowalskyj, Oleh
Loomis, Chad E.
Skiba, David C.
Works, Stephen

Affirmative All

Allen, Ernest E.
Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
Same meaning and requirements but put in a positive way...



First Revision No. 1-NFPA 110-2019 [Section No. 5.2.1.3]

5.2.1.3

A separate prototype unit shall be permitted to be utilized in a ~~Level 1 or~~ Level 2 installation, provided that all prototype tests produce no deleterious effects on the unit, and the authority having jurisdiction, the owner, and the user are informed that the unit is the prototype test unit.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 09:41:07 EDT 2019

Committee Statement

Committee Statement: For a Level 1 system, failure of the equipment to perform could result in loss of human life or serious injuries. Many of the prototype tests are potentially destructive or could reduce the life of the equipment. As such, prototype gensets shouldn't be used for Level 1 systems.

Response Message: FR-1-NFPA 110-2019

[Public Input No. 38-NFPA 110-2019 \[Section No. 5.2.1.3\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

18 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

The text is basically good, and handles the issue of the first users of the equipment understanding that it is not a new unit and has been used for prototype testing. However, it does not include the system designer that has specified the equipment and is technically responsible for system performance and does not indicate on the machine itself that it has been subject to prototype tests. There is no enforcement process to verify notifications have been done, so it is prudent to label the unit for what it is. Suggest changes to the text: ...the authority having jurisdiction, the system designer, the owner, and the user are informed that the unit has been exposed to potentially damaging tests during the prototype process and the unit is labeled by the manufacturer as a prototype test unit and is suitable for use only in NFPA 110 Level 2 systems.

Scroggins, Rich

add text that requires that the unit "is labeled by the manufacturer as a prototype test unit and is suitable for use only on NFPA 110 Level 2 systems." Reason is to prevent the unit from being re-purposed to a level 1 system after initial installation.

**First Revision No. 2-NFPA 110-2019 [Section No. 5.2.3]****5.2.3**

The energy converter for Level 1 systems shall be specifically designed, assembled, and tested to ensure intended system operation under the following conditions:

- (1) Short circuits, including phase-to-ground, phase-to-phase, and 3-phase bolted faults
- (2) Load surges due to motor starting
- (3) Elevator operations
- (4) Silicon-controlled rectifier (SCR) controllers
- (5) X-ray equipment
- (6) Overspeed, overtemperature, or overload
- (7) Adverse environmental conditions

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 09:49:04 EDT 2019

Committee Statement

Committee Statement: In the main paragraph, need to ensure intended operation for each of the listed condition. "Operation" is not the same as intended operation.

More detail has been added for the short circuit test. There are three types that each need to be tested (each type applies different stresses to the assembled equipment).

Response Message: FR-2-NFPA 110-2019

Public Input No. 39-NFPA 110-2019 [Section No. 5.2.3]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

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Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

The changes noted provide added assurance that the hardware provided will survive even potentially catastrophic failure modes and continue to operate under many of them. The "intended" should be understood to mean that some will cause shutdown but not damage, and others will operate properly during adverse conditions. The text added to 5.2.3.1 (short circuits) emphasizes that the generator set should not be damaged during any fault condition, but it may be required to shut down in order to prevent damage due to alternator thermal overload. An appendix note would be helpful here: A.5.2.3 EPS equipment is generally less resistant to the effects of "abnormal" conditions than the normal service system. But, it is important that the system operates through the referenced conditions without damage, and will continue to operate if possible.

**First Revision No. 27-NFPA 110-2019 [Section No. 5.2.5]****5.2.5**

The EPS shall be installed in accordance with *NFPA 70*.

Exception: When a listing process is not available for the engine-generator assembly, a field evaluation body acceptable to the authority having jurisdiction shall be permitted to affix a field label.

5.2.5.1

When a listing process is not available for the engine-generator assembly, a field evaluation body acceptable to the authority having jurisdiction shall be permitted to affix a field label.

Supplemental Information

File Name	Description Approved
FR-27_5.2.5_FINAL.docx	for prod use

Submitter Information Verification

Committee: EPS-AAA

Submission Date: Fri Oct 04 14:13:45 EDT 2019

Committee Statement

Committee Statement: The exception is converted to positive language to comply with the Manual of Style

Response Message: FR-27-NFPA 110-2019

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

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Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
No change in meaning but adjusted for style.



First Revision No. 3-NFPA 110-2019 [Section No. 5.6.2]

5.6.2 Prime Mover Ratings.

Proper derating factors, such as altitudes , ambient temperature, fuel energy content, accessory losses, and site conditions as recommended by the manufacturer of the engine shall be used in determining whether or not brake power meets the connected load requirements.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:08:53 EDT 2019

Committee Statement

Committee Statement: A generator set is installed at a specific location with a specific altitude, so the text should indicate singular rather than multiple altitudes.

Public Input No. 18-NFPA 110-2019 [Section No. 5.6.2]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

This is a proper change as it corrects language but does not impact on requirements

**First Revision No. 4-NFPA 110-2019 [Section No. 5.6.3.3]****5.6.3.3**

The prime mover shall be provided with the following instruments:

- (1) Oil pressure gauge to indicate lubricating oil pressure when a pressurized lubricating system is provided
- (2) Temperature gauge to indicate cooling medium temperature when a liquid medium cooling system is used
- (3) Hour meter to indicate actual total running time
- (4) Battery-charging meter indicating performance of prime mover-driven battery charging means where required by 5.6.3.6.1
- (5) Other instruments as recommended or provided by the prime mover manufacturer where required for maintenance

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:10:12 EDT 2019

Committee Statement

Committee Statement: Most modern Level 1 or Level 2 prime movers do not use the engine-driven alternator to charge the start/control batteries, instead relying on a permanent battery charger already required by 5.6.4.6. Section 5.6.3.6.1 allows for the use of only the automatic battery charger that is not an alternator driven from the engine if certain requirements are met.

Response Message: FR-4-NFPA 110-2019

Public Input No. 60-NFPA 110-2019 [Section No. 5.6.3.3]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

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Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Negative with Comment

Olson, Gary L.

This change is unnecessary because the standard already notes that engine-driven battery charging is not required in more than one location for Level 2 applications.

**First Revision No. 5-NFPA 110-2019 [Section No. 5.6.3.6.1]****5.6.3.6.1**

A battery charger driven by the prime mover shall not be required for Level 2 generators, provided the automatic battery charger ~~has a high-low rate~~, suitable for the battery technology, is capable of fully charging the starting battery within the time frame required by this standard while powering all loads connected to the starting batteries.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:25:43 EDT 2019

Committee Statement

Committee Statement: New battery technologies require new charging criteria.

Response Message: FR-5-NFPA 110-2019

Public Input No. 61-NFPA 110-2019 [Section No. 5.6.3.6.1]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan
Layegh, Pouyan
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O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

Needs a bit of text massaging: "...provided the automatic battery charger has suitable battery technology, and is capable of fully charging the starting battery within the time frame required by this standard..."



First Revision No. 6-NFPA 110-2019 [Section No. 5.6.4.3]

5.6.4.3* Number of Batteries.

Each prime mover that is started with electrochemical batteries shall be provided with both of the following:

- (1) Storage battery units as specified in Table 5.6.4.2
- (2) A storage rack for each battery or battery unit

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:34:26 EDT 2019

Committee Statement

Committee Statement: This change clarifies the requirement.

Response Message: FR-6-NFPA 110-2019

Public Input No. 51-NFPA 110-2019 [Section No. 5.6.4.3]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

This change is desirable due to the fact that devices other than batteries of various types may be used for starting equipment power.

**First Revision No. 7-NFPA 110-2019 [Section No. 5.6.4.5]****5.6.4.5 Type of Battery.**

The battery shall be of the nickel-cadmium or lead-acid type.

5.6.4.5.1*

~~Lead Vented (flooded) and valve-regulated (VRLA) lead -acid batteries shall be furnished as charged when wet. Drain unless they are drain -dry batteries- or dry-charged lead-acid batteries shall be permitted .~~

A.5.6.4.5.1

It is recommended that lead-acid starting batteries be replaced when semiannual testing with an internal ohmic test set indicates it is time to do so. If such testing is not conducted, it is recommended that lead-acid batteries be replaced every 24 to 30 months where the batteries are exposed to temperatures exceeding 27°C (approximately 81°F) for significant periods of time during the day or year, or every 36 to 60 months for cooler temperature exposures .

5.6.4.5.2

When furnished, vented nickel-cadmium batteries shall be filled and charged and shall have listed flip-top, flame arrester vent caps.

5.6.4.5.3

The manufacturer shall provide installation, operation, and maintenance instructions and, for batteries shipped dry, electrolyte mixing instructions.

5.6.4.5.4

Batteries shall not be installed until the battery charger is in service.

5.6.4.5.5

All batteries used in this service shall have been designed for this duty and shall have demonstrable characteristics of performance and reliability acceptable to the authority having jurisdiction.

5.6.4.5.6

Batteries shall be prepared for use according to the battery manufacturer's instructions.

Supplemental Information

File Name	Description	Approved
FR-7_A.5.6.4.5.1_legislative_changes.docx	annex changes - for staff use	

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:39:23 EDT 2019

Committee Statement

Committee Statement: The revision clarifies the 5.6.4.5.1 requirement.

Annex: This change reflects an expanded industry practice.

Response Message: FR-7-NFPA 110-2019

[Public Input No. 55-NFPA 110-2019 \[Section No. 5.6.4.5\]](#)

[Public Input No. 59-NFPA 110-2019 \[Section No. A.5.6.4.5.1\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

18 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

The changes noted are good additions to the appendix to provide useful guidance to a user on battery testing practice. I would add that use of temperature-compensated charging systems will help to prevent overcharging of batteries that has a significant negative impact on life, and will generally extend battery life.

Scroggins, Rich

Add this sentence at the end of the recommending change in the appendix (A.5.6.4.5.1): "The use of temperature compensated charging systems will help to prevent overcharging of batteries and will generally extend battery life." This is useful guidance on battery maintenance.

**First Revision No. 8-NFPA 110-2019 [Section No. 5.6.4.6]****5.6.4.6* Automatic Battery Charger.**

In addition to the prime mover—(engine—) driven charger (alternator), where required by 5.6.3.6 and in 5.6.3.6.1, a battery charger(s), as required in Table 5.6.4.2, shall be supplied installed for maintaining a charge on both the starting and control battery unit batteries.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 10:48:08 EDT 2019

Committee Statement

Committee Statement: The revision clarifies that the automatic charger is not the alternator.

Response Message: FR-8-NFPA 110-2019

Public Input No. 56-NFPA 110-2019 [Section No. 5.6.4.6]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

18 Affirmative All

0 Affirmative with Comments

2 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Negative with Comment

Feller, Louis J.

The change removes the reference to T5.6.4.2 which establishes re-charge time and sizing of charger.

Olson, Gary L.

This change has some good components but suffers from confusing and unnecessary text in some areas. I do not believe the references to 5.6.3.6 are necessary as they are covered elsewhere I would suggest deleting existing text and using: An AC-powered battery charger shall be installed for maintaining proper voltage for the system control and engine-starting batteries (when used).



First Revision No. 24-NFPA 110-2019 [Section No. 5.6.5.2]

5.6.5.2

Where a control panel is mounted on the energy converter, it shall be mounted by means of antivibration shock mounts, if required, to maximize reliability. An automatic control and safety panel shall be a part of the EPS containing the following equipment or possess the following characteristics, or both:

- (1) Cranking control equipment to provide the complete cranking cycle described in 5.6.4.2 and required by Table 5.6.4.2
- (2) Panel-mounted control switch(es) marked "run-off-automatic" to perform the following functions:
 - (a) Run: Manually initiate, start, and run prime mover
 - (b) Off: Stop prime mover or reset safeties, or both
 - (c) Automatic: Allow prime mover to start or stop by operating a remote contact.
- (3) Controls to shut down and lock out the prime mover under any of the following conditions:
 - (a) Failing to start after specified cranking time
 - (b) Overspeed
 - (c) Low lubricating-oil pressure
 - (d) High engine temperature (An automatic engine shutdown device for high lubricating-oil temperature shall not be required.)
 - (e) Operation of remote manual stop station
- (4) Individual alarm indication to annunciate any of the conditions listed in Table 5.6.5.2 and with the following characteristics:
 - (a) Battery powered
 - (b) Visually indicated
 - (c) Have additional contacts or circuits for a common audible alarm that signals locally and remotely when any of the itemized conditions occurs
 - (d) Have a lamp test switch(es) to test the operation of all alarm lamps
- (5) Controls to shut down the prime mover upon removal of the initiating signal or manual emergency shutdown
- (6) The ac instruments listed in 5.6.9.9

Table 5.6.5.2 Safety Indications and Shutdowns

Indicator Function (at Battery Voltage)	Level 1			Level 2		
	CV	S	RA	CV	S	RA
(a) Overcrank	X	X	X	X	X	O
(b) Low water temperature	X	NA	X	X	NA	O
(c) High engine temperature pre-alarm	X	NA	X	O	NA	NA
(d) High engine temperature	X	X	X	X	X	O
(e) Low lube oil pressure	X	X	X	X	X	O
(f) Overspeed	X	X	X	X	X	O
(g) Low fuel main tank	X	NA	X	O	NA	O
(h) Low coolant level	X	O	X	X	O	X
(i) EPS supplying load	X	NA	NA	O	NA	NA
(j) Control switch not in automatic position	X	NA	X	X	NA	X
(k) High battery voltage	X	NA	NA	O	NA	NA
(l) Low cranking voltage	X	NA	X	O	NA	O
(m) Low voltage in battery	X	NA	NA	O	NA	NA
(n) Battery charger ac failure	X	NA	NA	O	NA	NA
(o) Lamp test	X	NA	NA	X	NA	NA
(p) Contacts for local and remote common alarm	X	NA	X	X	NA	X
(q) Audible alarm silencing switch	NA	NA	X	NA	NA	O

Indicator Function (at Battery Voltage)	Level 1			Level 2		
	CV	S	RA	CV	S	RA
(r) Low starting air pressure	X	NA	NA	O	NA	NA
(s) Low starting hydraulic pressure	X	NA	NA	O	NA	NA
(t) Air shutdown damper when used	X	X	X	X	X	O
(u) Remote emergency stop	NA	X	NA	NA	X	NA
<u>(v) Overload alarm/load shed contact</u>	<u>X</u>	<u>NA</u>	<u>X</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>

CV: Control panel-mounted visual. S: Shutdown of EPS. RA: Remote audible. X: Required. O: Optional. NA: Not applicable.

Notes:

(1) Item (p) shall be provided, but a separate remote audible signal shall not be required when the regular work site in 5.6.6 is staffed 24 hours a day.

(2) Item (b) is not required for combustion turbines.

(3) Item (r) or (s) shall apply only where used as a starting method.

(4) Item (i) EPS ac ammeter shall be permitted for this function.

(5) All required CV functions shall be visually annunciated by a remote, common visual indicator.

(6) All required functions indicated in the RA column shall be annunciated by a remote, common audible alarm as required in 5.6.5.2(4).

(7) Item (g) on gaseous systems shall require a low gas pressure alarm.

(8) Item (b) shall be set at 11°C (20°F) below the regulated temperature determined by the EPS manufacturer as required in 5.3.1.

Supplemental Information

File Name	Description	Approved
FR_24_attachment_for_change_to_table_5.6.5.2.docx	file for table 5.6.5.2 table change - for staff use	

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Fri Aug 16 15:58:00 EDT 2019

Committee Statement

Committee Statement: NFPA 70 Section 700.4 (B) requires "elective load pick up and load shedding"when both emergency and other loads are served from a common generator.

Response Message: FR-24-NFPA 110-2019

[Public Input No. 42-NFPA 110-2019 \[Section No. 5.6.5.2\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

This is an important and often-ignored point: Emergency systems are required to shed non-emergency loads if they are overloaded, but most designers ignore this requirement and simply oversize the system so it is “not required” in their minds. The NEC does not technically allow that, so this change amplifies the need to actually use these functions.



First Revision No. 11-NFPA 110-2019 [New Section after 7.2.6]

7.2.6.1

Generator sets installed in outdoor enclosures shall be provided with a minimum of 0.9 m (36 in.) of working space access for inspection, repair, maintenance, cleaning, or replacement from the outside edge of the enclosure, or sufficient space to fully open all hinged doors, whichever is greater.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 16:30:03 EDT 2019

Committee Statement

Committee Statement: Outdoor generator sets require access space for regular maintenance.

Response Message: FR-11-NFPA 110-2019

Public Input No. 21-NFPA 110-2019 [New Section after 7.2.6]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

This text addition is very important because generator set enclosures vary significantly in dimensions depending on supplier, so a designer that configures a site for one supplier may find that a different supplier's equipment will not allow proper access for service and maintenance. I am not aware of anything that directly drives this requirement, but if proper access is not maintained, operator/technician safety and equipment serviceability is hampered at best

**First Revision No. 28-NFPA 110-2019 [Section No. 7.13.4.5]****7.13.4.5**

All safeties specified in 5.6.5 and 5.6.6 shall be tested on site as recommended by the manufacturer.

~~Exception No. 1: It shall be permitted for the manufacturer to test and document overcrank, high engine temperature, low lube oil pressure and overspeed safeties prior to shipment.~~

~~Exception No. 2: Where the safety functions are proven to be fail-safe as demonstrated by monitoring of normal conditions on engine metering and demonstration that a failed sensor or circuit will not cause shutdown of the engine, further testing of the safeties is not required.~~

7.13.4.5.1

It shall be permitted for the manufacturer to test and document overcrank, high engine temperature, low lube oil pressure and overspeed safeties prior to shipment.

7.13.4.5.2

Where the safety functions are proven to be fail-safe as demonstrated by monitoring of normal conditions on engine metering and demonstration that a failed sensor or circuit will not cause shutdown of the engine, further testing of the safeties is shall not be required.

Supplemental Information

File Name	Description Approved
FR-28_7.13.4.5_FINAL.docx	for prod use

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Fri Oct 04 14:16:34 EDT 2019

Committee Statement

Committee Statement: The exception is converted to positive language to comply with the Manual of Style

Response Message: FR-28-NFPA 110-2019

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

good change, but correct text as follows: ...demonstration that a failed sensor or circuit will not cause a shutdown of the engine, further testing of the safeties shall not be required.

**First Revision No. 13-NFPA 110-2019 [Section No. 8.3.6 [Excluding any Sub-Sections]]**

Storage batteries, including electrolyte levels or battery voltage, used in connection with starting and control systems shall be inspected weekly and maintained in full compliance with manufacturer's manufacturers' specifications recommendations .

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Tue Aug 13 17:39:31 EDT 2019

Committee Statement

Committee Statement: Requirements have been added to cover inspection and maintenance of control batteries supplying power to parallel gear.

Response Message: FR-13-NFPA 110-2019

Public Input No. 11-NFPA 110-2019 [Section No. 8.3.6 [Excluding any Sub-Sections]]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

For consistency with other requirements for maintenance (FR-22, if adopted), I would suggest the following:
“...shall be inspected weekly (unless monitored in compliance to 8.4.1) and maintained in full compliance...”

**First Revision No. 14-NFPA 110-2019 [Section No. 8.4.1]****8.4.1***

~~EPSSs~~ EPSSs, including all appurtenant components, shall be inspected weekly, and the EPSS shall be and- exercised under load at least monthly.

8.4.1.1

If the ~~generator set~~ EPS is used for standby power or for peak load shaving, such use shall be recorded and shall be permitted to be substituted for scheduled operations and testing of the ~~generator set~~ EPS, providing the same record as required by 8.3.4.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 09:03:26 EDT 2019

Committee Statement

Committee Statement: The language has been revised to clarify that the EPS is intended to be inspected weekly not the EPSS.

Response Message: FR-14-NFPA 110-2019

[Public Input No. 40-NFPA 110-2019 \[Section No. 8.4.9.5\]](#)

[Public Input No. 10-NFPA 110-2019 \[Section No. 8.4.1 \[Excluding any Sub-Sections\]\]](#)

[Public Input No. 43-NFPA 110-2019 \[Section No. 8.4\]](#)

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

minor text editing: If EPS equipment is used for standby power or for peak load shaving, such use shall be recorded and shall be permitted to be substituted for scheduled operations and testing of the EPS, providing the same record as required by 8.3.4 is provided and retained.

**First Revision No. 29-NFPA 110-2019 [Section No. 8.4.3]****8.4.3**

The EPS test shall be initiated by simulating a power outage using the test switch(es) on the ATSS an ATS, parallel gear, other remote control system, or by opening a normal breaker. ~~Opening a normal breaker shall not be required.~~

8.4.3.1

Opening a normal breaker shall not be required.

8.4.3.2*

Where multiple ATSS are used as part of an EPSS, the monthly test initiating ATSS shall be rotated to verify the starting function on each ATS.

Supplemental Information

File Name	Description Approved
FR-29_8.4.3_FINAL.docx	for prod use

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Mon Oct 07 11:37:06 EDT 2019

Committee Statement

Committee Statement: It is possible to start an EPS using controls mounted on the parallel switch gear. In some cases it is more convenient to use this method, especially when monitoring multiple loads on a screen mounted on the parallel gear.

The section has been separated into two requirements to be in compliance with the Manual of Style.

Response Message: FR-29-NFPA 110-2019

Public Input No. 9-NFPA 110-2019 [Section No. 8.4.3 [Excluding any Sub-Sections]]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

18 Affirmative All

0 Affirmative with Comments

2 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Negative with Comment

Olson, Gary L.

Since this requirement is for an emergency power supply system, and those systems primarily use listed automatic transfer switches for power transfer functions, I believe that all testing should be initiated by use of a test switch on a transfer switch or opening a normal source breaker feeding an ATS, because that tests not only the starting of the generator system but also the circuit signaling starting, and operation of the ATS. While it may be far more convenient for the operator to go to a single control panel and push a test switch, that is nowhere near as effective and represents a significant softening of a true test requirement. 8.4.3.1 and 8.4.3.2 are both OK

Scroggins, Rich

Allowing an operator to initiate a test at the control panel rather than the ATS would result in the ATS start signal not being tested.

**First Revision No. 16-NFPA 110-2019 [Section No. 8.4.7.1]****8.4.7.1**

Circuit breakers rated in excess of 600 1,000 volts for Level 1 system usage shall be exercised every 6 12 months and shall be tested under simulated overload conditions every 2 3 years.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 09:09:05 EDT 2019

Committee Statement

Committee Statement: The voltage level has been increased from 600V to 1000V to correlate with the NEC voltage levels. The mechanical operation of circuit breakers over 1000V has been changed from 6 months to 1 year in order to align with NFPA 70B. The electrical loading test for breakers over 1000V has also been revised from 2 years to 3 years in order to align with NFPA 70B.

Response Message: FR-16-NFPA 110-2019

Ballot Results

✓ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

Good to coordinate with other standards.

**First Revision No. 22-NFPA 110-2019 [New Section after 8.4.9]****8.4.10**

Where automated equipment and system monitoring technology is employed, it shall be permitted to substitute this system for weekly inspections of the monitored equipment and systems required in 8.4.1 .

8.4.10.1

Records from automated equipment and system monitoring systems shall comply with Section 8.5 .

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 10:16:46 EDT 2019

Committee Statement

Committee Statement: New technology can diagnose problems with equipment and systems. This change will allow its use in lieu of visual inspections. This change does not relieve monthly requirements.

Response Message: FR-22-NFPA 110-2019

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

18 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

Comment: While I think this is a good addition for site efficiency, I believe that there should be a comment in the appendix that notes that engine-driven equipment (in particular) requires informal monitoring to verify that liquids from the fuel, lubrication, and cooling systems are not leaking. This should be done on a weekly basis, because of the risks associated with leaks from these systems, and the fact that a monitoring system might not pick these up before significant damage is done.

Scroggins, Rich

Add requirement in the appendix that in order to be acceptable as a substitute for a weekly inspection, the monitoring system must detect leaks of fuel, lubrication and cooling systems, and other leaks as appropriate.

**First Revision No. 18-NFPA 110-2019 [Section No. A.4.4.1]****A.4.4.1**

Typically, Level 1 systems are intended to automatically supply illumination or power, or both, to critical areas and equipment in the event of failure of the primary supply or in the event of danger to elements of a system intended to supply, distribute, and control power and illumination essential for safety to human life. Other NFPA codes and standards such as NFPA 20, NFPA 99, ~~and NFPA 101, and NFPA 1221~~ provide specific requirements on where Level 1 systems are required.

Essential electrical systems can provide power for the following essential functions:

- (1) Life safety illumination
- (2) Fire detection, ~~and alarm, and notification~~ systems
- (3) Elevators
- (4) Fire pumps
- (5) ~~Public safety~~ Emergency services communications systems
- (6) Industrial processes where current interruption would produce serious life safety or health hazards
- (7) Essential ventilating and smoke removal systems

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 09:27:06 EDT 2019

Committee Statement

Committee Statement: The addition of "notification" to detection and alarm clarifies the importance of safety for building occupants / visitors and ensures the complete system requires Level 1 generator back-up. The change from "public safety" to "emergency services" communications systems aligns the language with NFPA-1221, Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems. The term "communications" has very broad meaning and is used in many NFPA documents, including NFPA 110, 101, 72 and 1221 in several differing contexts.

Response Message: FR-18-NFPA 110-2019

Public Input No. 15-NFPA 110-2019 [Section No. A.4.4.1]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

Good additions, but the word "Typically" is unnecessary and should be eliminated.

**First Revision No. 19-NFPA 110-2019 [Section No. A.4.4.2]****A.4.4.2**

Typically, Level 2 systems are intended to supply power automatically to selected loads (other than those classed as emergency systems) in the event of failure of the primary source.

Level 2 systems typically are installed to serve loads, such as the following, that, when stopped due to any interruption of the primary electrical supply, could create hazards or hamper rescue or fire-fighting operations:

- (1) Heating and refrigeration systems
- (2) Communications systems
- (3) Ventilation and smoke removal systems
- (4) Sewage disposal
- (5) Lighting, including unit equipment defined in NFPA 70 (NEC), 700.12
- (6) Industrial processes

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 09:33:56 EDT 2019

Committee Statement

Committee Statement: In some cases, telecommunications offices have standby generators that can provide power to the entire facility. This is in addition to the battery backup in place for telecommunications equipment and integral battery backup for listed exit and emergency lighting. Since the emergency lighting relies primarily on its battery backup for operation during a commercial power outage, the secondary mean to power via the generator should not imply the generator is now a level 1 system. However, some AHJs treat these installations as level 1, even though the life safety illumination is listed and meets the code based on its use of a battery backup. Noting that listed life safety illumination with integral battery backup are level 2 loads helps prevent what is a misapplication of the standard.

Response Message: FR-19-NFPA 110-2019

[Public Input No. 17-NFPA 110-2019 \[Section No. A.4.4.2\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James
Kowalskyj, Oleh
Loomis, Chad E.
Skiba, David C.
Works, Stephen

Affirmative All

Allen, Ernest E.
Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
While I am not sure this is really necessary, I guess it's not going to do any damage...

**First Revision No. 20-NFPA 110-2019 [Section No. A.5.6.4.4]****A.5.6.4.4**

Cold-cranking amperes (CCA), or cranking performance, are the number of amperes a fully charged battery at -17.8°C (0°F) can continuously deliver for 30 seconds while maintaining not dropping below 1.2 V per cell for lead-acid or 0.65 V per cell for NiCd. Cranking amperes, which are more applicable for engine starting applications using a battery heater pad, is the same measure of capacity done at 0°C (32°F).

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 09:59:05 EDT 2019

Committee Statement

Committee Statement: The wording in the present edition applies to only one type of battery (lead-acid) covered in the corresponding body text. Ni-Cd technology is included since it is also covered in the corresponding body text. Additions include defining cranking amperes, which is a rating at a temperature more applicable to stationary engines covered by this standard (because this standard, in 5.3.5, specifies that the engine room or enclosure shall be heated to maintain a minimum input air temperature of 4.5°C (40°F)). Cold-cranking amperes are more applicable to vehicle applications.

Response Message: FR-20-NFPA 110-2019

[Public Input No. 58-NFPA 110-2019 \[Section No. A.5.6.4.4\]](#)

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

19 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
Useful information for those unfamiliar with battery terminology.

**First Revision No. 12-NFPA 110-2019 [Section No. A.7.9.1.2]****A.7.9.1.2**

To optimize the long-term storage of fuels for prime movers, the fuel tanks should be kept cool and dry, and the tank as full as possible. Tanks that are subject to temperature variations can experience accelerated fuel degradation, especially if the tanks are outside and above ground or close to an extreme heat source if stored inside a structure. The more constant and cooler the tank temperatures, the less likely temperature-related fuel degradation will occur. Tank ullage (air space) should be kept to a minimum. Excess air space allows for warm, humid air to enter the tank and condense moisture during the cool evening. Also, prolonged exposure to ambient air, which is 20 percent oxygen, can facilitate oxidative degradation of the fuel. Fuel storage tanks should be kept as dry as possible and have provisions for water drainage on a regular basis. The presence of water can lead to microbiological contamination and growth, which in turn can lead to general or pitting corrosion of steel tanks and components, possibly resulting in filter plugging, operational issues, or a hydrocarbon release to the environment. Regularly scheduled surveillance of the fuel allows the operator(s) to evaluate the condition of the fuel and make important decisions regarding the quality of the fuel dedicated to reliable operation of the prime mover. Fuel maintenance and testing should begin the day of installation and first fill in order to establish a benchmark guideline for future comparison. Consideration should be given to providing new tanks with a floating suction fuel pickup system. Laboratory testing services should always be sought from a qualified or certified petroleum laboratory.

Submitter Information Verification**Committee:** EPS-AAA**Submittal Date:** Tue Aug 13 16:46:27 EDT 2019**Committee Statement****Committee Statement:** Providing floating suction reduces the risk of contaminated fuel from being drawn into the fuel system.**Response Message:** FR-12-NFPA 110-2019Public Input No. 22-NFPA 110-2019 [New Section after 7.9.1.2]**Ballot Results****✔ This item has passed ballot**

27 Eligible Voters

7 Not Returned

18 Affirmative All

1 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Sappington, Steve R.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

I understand that most airports have used these floating suction fuel pickup systems to minimize the possibility of getting water into the engine fuel system. This is particularly important with newer fuel systems which have high precision injection systems that can be severely damaged by water. It also helps the engine get most of the fuel out of the tank.

Negative with Comment

Smidt, Ronald M.

I believe we may be pointing users to a fuel pick up system that is proprietary. While I realize that annex material is not enforceable, it is my concern that in some cases we are creating a potential advantage for the maker of this product. I will be glad to re-visit in the next revision.

**First Revision No. 23-NFPA 110-2019 [Section No. A.8.4.7]****A.8.4.7**

Circuit breakers should be tested under simulated overload conditions every 2 3 years.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 10:28:32 EDT 2019

Committee Statement

Committee Statement: This revision aligns with NFPA 70B recommendations.

Response Message: FR-23-NFPA 110-2019

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

7 Not Returned

18 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Skiba, David C.

Works, Stephen

Affirmative All

Allen, Ernest E.

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.
Sappington, Steve R.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
Alignment with other standards is good reason to do this.
Smidt, Ronald M.
This is a good change and aligns with other standard practices.



NATIONAL FIRE PROTECTION ASSOCIATION

The leading information and knowledge resource on fire, electrical and related hazards

M E M O R A N D U M

TO: Technical Committee on Emergency Power Supplies

FROM: Sarah Caldwell, *Technical Committee Administrator*

DATE: November 14, 2019

SUBJECT: NFPA 111 First Draft Technical Committee FINAL Ballot Results (A2021)

According to the final ballot results, all ballot items received the necessary affirmative votes to pass ballot.

27 Members Eligible to Vote

9 Members Not Returned (*Allen, Cotton, Dagenais, Hunt, Kowalskij, Loomis, Sappington, Skiba, Works*)

The attached report shows the number of affirmative, negative, and abstaining votes as well as the explanation of the vote for **each** revision.

To pass ballot, **each** revision requires: (1) a simple majority of those eligible to vote and (2) an affirmative vote of $\frac{2}{3}$ of ballots returned. See Sections 3.3.4.3.(c) and 4.3.10.1 of the ***Regulations Governing the Development of NFPA Standards***.



First Revision No. 1-NFPA 111-2019 [Section No. 2.4]

2.4 References for Extracts in Mandatory Sections.

NFPA 1, *Fire Code*, 2018 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2016 2019 edition.

NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, 2020 edition.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 10:32:59 EDT 2019

Committee Statement

Committee Statement: Reference to NFPA 855 is included to cover extracts added to NFPA 111.

Response Message: FR-1-NFPA 111-2019

[Public Input No. 3-NFPA 111-2019 \[Section No. 2.4\]](#)

[Public Input No. 4-NFPA 111-2019 \[Section No. 2.4\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
no issues on this one

**First Revision No. 2-NFPA 111-2019 [Section No. 3.3.1]****3.3.1 Battery.**

~~Two or more~~ A single cell or a group of cells connected together electrically in series or , in parallel, or both, to provide the required operating voltage and current levels a combination of both . [**855**, 2020]

3.3.1.1* Lead-Acid (LA) Cell.

A secondary cell in which the active material of the positive electrode is lead dioxide, the active material of the negative electrode is lead, and the electrolyte is dilute sulfuric acid.

3.3.1.1.1* Valve-Regulated (VRLA).

A lead-acid battery consisting of sealed cells furnished with a valve that opens to vent the battery whenever the internal pressure of the battery exceeds the ambient pressure by a set amount. [1, 2018]

3.3.1.1.2* Vented (Flooded).

A lead-acid battery consisting of cells that have electrodes immersed in liquid electrolyte. [1, 2018]

3.3.1.2 Nickel-Cadmium (NiCd) Cell.

A secondary cell in which the active material of the positive electrode is nickel oxyhydroxide, the active material of the negative electrode is cadmium, and the electrolyte is dilute potassium hydroxide.

3.3.1.3 Nickel-Metal Hydride (NiMH) Cell.

A secondary cell in which the active material of the negative electrode is a hydrogen-absorbing alloy and the positive electrode is nickel.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 10:38:48 EDT 2019

Committee Statement

Committee Statement: The definition is revised to reflect an extract from NFPA 855.

Response Message: FR-2-NFPA 111-2019

Public Input No. 5-NFPA 111-2019 [Section No. 3.3.1]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James
Kowalskyj, Oleh
Loomis, Chad E.
Sappington, Steve R.
Skiba, David C.
Works, Stephen

Affirmative All

Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
definition change is ok as is

**First Revision No. 14-NFPA 111-2019 [Section No. 3.3.3]****3.3.3*** Electrochemical Energy Storage Device System .

A device based on the interrelated transformations of chemical and electric energy, usually consisting of an anode, a cathode, and an electrolyte plus such connections (electrical and mechanical) as needed to allow the cell to deliver or receive electric energy.

A.3.3.3 Electrochemical Energy Storage Device System .

Examples of electrochemical energy storage devices systems include batteries and ultracapacitors.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Thu Aug 22 10:41:47 EDT 2019

Committee Statement

Committee Statement: NFPA 111 is revised to align with NFPA 855.

Response Message: FR-14-NFPA 111-2019

[Public Input No. 7-NFPA 111-2019 \[Section No. A.3.3.3\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
ok as is



First Revision No. 3-NFPA 111-2019 [New Section after 3.3.7]

3.3.7 Energy Storage System Cabinet.

A cabinet containing components of the energy storage system that is included in the UL 9540 listing for the system where personnel cannot enter the enclosure other than reaching in to access components for maintenance purposes. [855 , 2020]

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 10:54:02 EDT 2019

Committee Statement

Committee Statement: The definition of a term added to NFPA 111 has been extracted from NFPA 855.

Response Message: FR-3-NFPA 111-2019

Public Input No. 6-NFPA 111-2019 [New Section after 3.3.7]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Negative with Comment

Olson, Gary L.

I agree with the statement (I think) but the writing is hard to understand. I assume that the intent is that this cabinet is designed so that only components that are required to be accessed for maintenance are accessible to a technician.

**First Revision No. 4-NFPA 111-2019 [Section No. 5.1.1.3]****5.1.1.3 Battery Installation.**

Battery installations shall comply with the following:

- (1) Vented batteries (LA, NiCd, NiMH) shall be installed in a room(s) dedicated to the batteries and associated equipment with approved ventilation.
- (2) Vented batteries shall be mounted on open racks.
- (3) Sealed and valve-regulated batteries (VRLA, NiMH, LI) shall be permitted in dedicated battery rooms. ~~Batteries~~, and shall be mounted in ~~either one~~ of the following ways:
 - (a) On open racks
 - (b) In listed battery cabinets
 - (c) In energy storage system cabinets
- (4) Distributed sealed and valve-regulated batteries (VRLA, NiMH, LI) shall be permitted in occupied spaces and shall be mounted in one of the following ways:
 - (a) In listed battery energy storage system cabinets with restricted access (tool or key required)
 - (b) In listed console or package style
 - (c) In a combination of 5.1.1.3 (4)(a) ~~(a)~~ and ~~(b)~~ 5.1.1.3 (4)(b)

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:08:39 EDT 2019

Committee Statement

Committee Statement: The text is changed to reflect current terminology in NFPA 855.

Response Message: FR-4-NFPA 111-2019

Public Input No. 8-NFPA 111-2019 [Section No. 5.1.1.3]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

9 Not Returned

16 Affirmative All

2 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh
Loomis, Chad E.
Sappington, Steve R.
Skiba, David C.
Works, Stephen

Affirmative All

Chisholm, Sr., Dan
Day, Richard L.
Feller, Louis J.
Gregory, James R. (Skip)
Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
ok as written
Scroggins, Rich

Remove the word "battery" from (4) (a). "Energy Storage System cabinet" is a sufficient description. The word "battery" is redundant.



First Revision No. 15-NFPA 111-2019 [Section No. 6.4.2]

6.4.2 Bypass Switch Rating.

~~The bypass switch shall have a continuous current rating and shall withstand a current rating compatible with that of the associated transfer switch.~~

~~Exception: UPS static bypass transfer switches shall be permitted to have a current rating and interrupting rating for all classes of loads to be served sufficient to support all connected loads from either source.~~

6.4.2.1

The bypass switch shall have a continuous current rating and shall withstand a current rating compatible with that of the associated transfer switch.

6.4.2.2

UPS static bypass transfer switches shall be permitted to have a current rating and interrupting rating for all classes of loads to be served sufficient to support all connected loads from either source.

Submitter Information Verification

Committee: EPS-AAA

Submission Date: Mon Sep 16 10:28:45 EDT 2019

Committee Statement

Committee Statement: Exception converted to positive text to comply with the Manual of Style.

Response Message: FR-15-NFPA 111-2019

Ballot Results

✓ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Negative with Comment

Olson, Gary L.

A transfer switch with isolation bypass should be a listed product, and if it is, it is inherently going to have a compatible bypass switch. I don't think the text related to bypass/transfer switch is needed.



First Revision No. 6-NFPA 111-2019 [Section No. 7.1.3]

7.1.3

The SEPSS equipment shall be installed in a manner and location recommended by the manufacturer and acceptable to the authority having jurisdiction where applicable in accordance with NFPA 855 .

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:22:02 EDT 2019

Committee Statement

Committee Statement: NFPA 111 is revised to align with NFPA 855.

Response Message: FR-6-NFPA 111-2019

Public Input No. 10-NFPA 111-2019 [Section No. 7.1.3]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

This is better as it indicates that as long as it is listed, the AHJ can't reject it except for incorrect installation.

**First Revision No. 5-NFPA 111-2019 [Section No. 7.2.1 [Excluding any Sub-Sections]]**

The SEPSS shall be located in a room(s) in accordance with the manufacturer's environmental specifications and where applicable in accordance with NFPA 855 .

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:19:03 EDT 2019

Committee Statement

Committee Statement: NFPA 111 is revised to align with NFPA 855.

Response Message: FR-5-NFPA 111-2019

Public Input No. 11-NFPA 111-2019 [Section No. 7.2.1]

Ballot Results

✔ **This item has passed ballot**

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
ok as is



First Revision No. 7-NFPA 111-2019 [Section No. 7.3.2]

7.3.2

Provisions shall be made for sufficient diffusion and ventilation of the flammable gases from the battery or other electrochemical energy storage devices systems to limit the concentration of flammable gas in accordance with NFPA 1 NFPA 855 or other applicable codes or standards .

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:32:09 EDT 2019

Committee Statement

Committee Statement: The reference to NFPA 1 is changed to NFPA 855. NFPA 1 will refer stored energy systems to NFPA 855.

Response Message: FR-7-NFPA 111-2019

[Public Input No. 13-NFPA 111-2019 \[Section No. 7.3.2\]](#)

[Public Input No. 14-NFPA 111-2019 \[Section No. 7.3.3.1\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

ok as is



First Revision No. 8-NFPA 111-2019 [Section No. 8.2.1]

8.2.1

At least two sets of instruction manuals for the SEPSS shall be supplied by the manufacturer of the SEPSS and shall contain the following:

- (1) A detailed explanation of the operation of the system
- (2) A schematic wiring diagram
- (3) A function block diagram
- (4) The energy storage ~~device's~~ system's specification, installation instructions, maintenance information, and wiring diagrams
- (5) Instructions for routine maintenance
- (6) Recommended spare parts list with part numbers and part sources
- (7) Routine troubleshooting procedures

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:39:02 EDT 2019

Committee Statement

Committee Statement: NFPA 111 is revised to align with NFPA 855.

Response Message: FR-8-NFPA 111-2019

Public Input No. 15-NFPA 111-2019 [Section No. 8.2.1]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

ok, but consider adding a note that documentation can be either hardcopy or electronic format based on the requirements of the owner, operator, or system designer.

**First Revision No. 10-NFPA 111-2019 [Section No. A.6.2.2]****A.6.2.2**

See ANSI/UL UL 1008, ~~Standard for~~ Safety Transfer Switch Equipment.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:41:16 EDT 2019

Committee Statement

Committee Statement: NFPA 111 is revised to align with UL terminology.

Response Message: FR-10-NFPA 111-2019

Public Input No. 1-NFPA 111-2019 [Section No. A.6.2.2]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

0 Affirmative with Comments

1 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Negative with Comment

Olson, Gary L.

The name of the standard is incorrect and should be corrected to: UL 1008 Transfer Switch Equipment



First Revision No. 11-NFPA 111-2019 [Section No. C.1.1]

C.1.1 NFPA Publications.

National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169-7471.

NFPA 70[®], *National Electrical Code*[®], 2017 2020 edition.

NFPA 99, *Health Care Facilities Code*, 2018 2021 edition.

NFPA 101[®], *Life Safety Code*[®], 2018 2021 edition.

NFPA 110, *Standard for Emergency and Standby Power Systems*, 2016 2022 edition.

NFPA 855 , *Standard for the Installation of Stationary Energy Storage Systems* , 2020 edition.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:43:33 EDT 2019

Committee Statement

Committee Statement: NFPA 855 is now referenced within NFPA 111.

Response Message: FR-11-NFPA 111-2019

Public Input No. 16-NFPA 111-2019 [Section No. C.1.1]

Public Input No. 18-NFPA 111-2019 [Section No. C.3]

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.

Hartsell, Jonathan

Layegh, Pouyan

Manche, Alan

O'Connor, Daniel J.

Savage, Sr., Michael L.

Schroeder, Ronald A.

Schubert, Randy H.

Scroggins, Rich

Smidt, Ronald M.

Stanko, Raymond J.

Stymiest, David

Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.

ok as is



First Revision No. 12-NFPA 111-2019 [Section No. C.1.2.4]

C.1.2.4 UL Publications.

UL-LLC Underwriters Laboratories Inc. , 333 Pfingsten Road, Northbrook, IL 60062-2096.

ANSI/UL UL 1008, *Standard for Safety Transfer Switch Equipment*, 2014.

Submitter Information Verification

Committee: EPS-AAA

Submittal Date: Wed Aug 14 11:45:36 EDT 2019

Committee Statement

Committee Statement: Newly referenced UL standards have been added to the annex.

Response Message: FR-12-NFPA 111-2019

[Public Input No. 2-NFPA 111-2019 \[Section No. C.1.2.4\]](#)

[Public Input No. 17-NFPA 111-2019 \[Section No. C.1.2.4\]](#)

Ballot Results

✔ This item has passed ballot

27 Eligible Voters

9 Not Returned

17 Affirmative All

1 Affirmative with Comments

0 Negative with Comments

0 Abstention

Not Returned

Allen, Ernest E.

Cotton, Kenneth A.

Dagenais, David A.

Hunt, James

Kowalskyj, Oleh

Loomis, Chad E.

Sappington, Steve R.

Skiba, David C.

Works, Stephen

Affirmative All

Chisholm, Sr., Dan

Day, Richard L.

Feller, Louis J.

Gregory, James R. (Skip)

Hardy, Ross M.
Hartsell, Jonathan
Layegh, Pouyan
Manche, Alan
O'Connor, Daniel J.
Savage, Sr., Michael L.
Schroeder, Ronald A.
Schubert, Randy H.
Scroggins, Rich
Smidt, Ronald M.
Stanko, Raymond J.
Stymiest, David
Windey, Timothy P.

Affirmative with Comment

Olson, Gary L.
same comment as FR-10