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

[Revise 8.4.2 as shown below:]

8.4.2*~~*~~

~~Generator sets~~EPSSin 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 kW × 30% = 30 kW, but 80 kW × 30% = 24 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 EPSs, 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

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 langue to comply with the Manual of Style.
Response Message: FR-26-NFPA 110-2019

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]

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]

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

Committee Statement

Committee Statement: The exception is converted to positive langue to comply with the Manual of Style
Response Message: FR-27-NFPA 110-2019

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]

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]

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]

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]

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]

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]

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

	Level 1			Level 2		
Indicator Function (at Battery Voltage)	**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

	Level 1			Level 2		
Indicator Function (at Battery Voltage)	**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
(v) Overload alarm/load shed contact	X	NA	X	NA	NA	NA

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]

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]

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 langue to comply with the Manual of Style
Response Message: FR-28-NFPA 110-2019

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]]

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

8.4.1*

~~EPSSs~~ EPSs , 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]

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]]

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

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

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]

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 lightning. 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]

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]

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 110-2019

Public Input No. 22-NFPA 110-2019 [New Section after 7.9.1.2]

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