SENS® STORED ENERGY SYSTEMS

2025 NFPA 110 Changes And why it matters to you

Stored Energy Systems
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WHAT IS NFPA 110?

- NFPA 110 governs emergency generator requirements, performance, and maintenance for life safety applications.
- Other applications and facilities (mission critical, standby power) often use NFPA 110 as their generator compliance guideline.
- NFPA 110 is designed to ensure the reliability of the emergency generator.

NFPA®

110

Standard for
Emergency and Standby
Power Systems

2025

THE 2025 NFPA 110 REQUIREMENTS HAVE NOW BEEN RELEASED

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EPSS CLASS, TYPE, & LEVEL

NFPA 110 outlines 3 areas that categorize the emergency generator (EPSS)

4.2 Class

- Defines minimum hours the EPSS is designed to operate at its rated load without being refueled or recharged.

[See Table 4.1(a).]

4.3 Type

- Defines maximum seconds the EPSS will permit the load terminals of the transfer switch to be without power.

[See Table 4.1(a).]

4.4 Level

- Defines two levels of criticality of operation
  - Level 1
    Loss of life or serious injury
  - Level 2
    Less risk to life or injury

CHANGE #1 - 4.1 (B) - EPSS TYPE CHANGE

- Type X, a custom power restoration time requirement, is now allowed
- Let's facilities specify a custom period of time from the grid outage to when the emergency generator must be able to power critical loads

Designation	Power Restoration
Type U	Basically uninterruptible (UPS systems)
Type 10	10 sec
Type 60	60 sec
Type 120	120 sec
Type M	Manual stationary or nonautomatic - no time limit
Type X	Other time, in seconds, as required by the application, code, or user

CHANGE #2 - 5.5.3 – EPSS FUEL TANK CAPACITY

2025 NFPA 110
For classifications of 24 hours or less, the main fuel tank shall have a minimum capacity of at least 133% of the low-fuel sensor.

For classifications of greater than 24 hours, the main fuel tank shall have a capacity of at least 100% of the low-fuel sensor.

2022 NFPA 110
The main fuel tank shall have a minimum capacity of at least 133% of the low-fuel sensor

CHANGE #3 - 5.6.4.5 – STARTING BATTERY TYPE

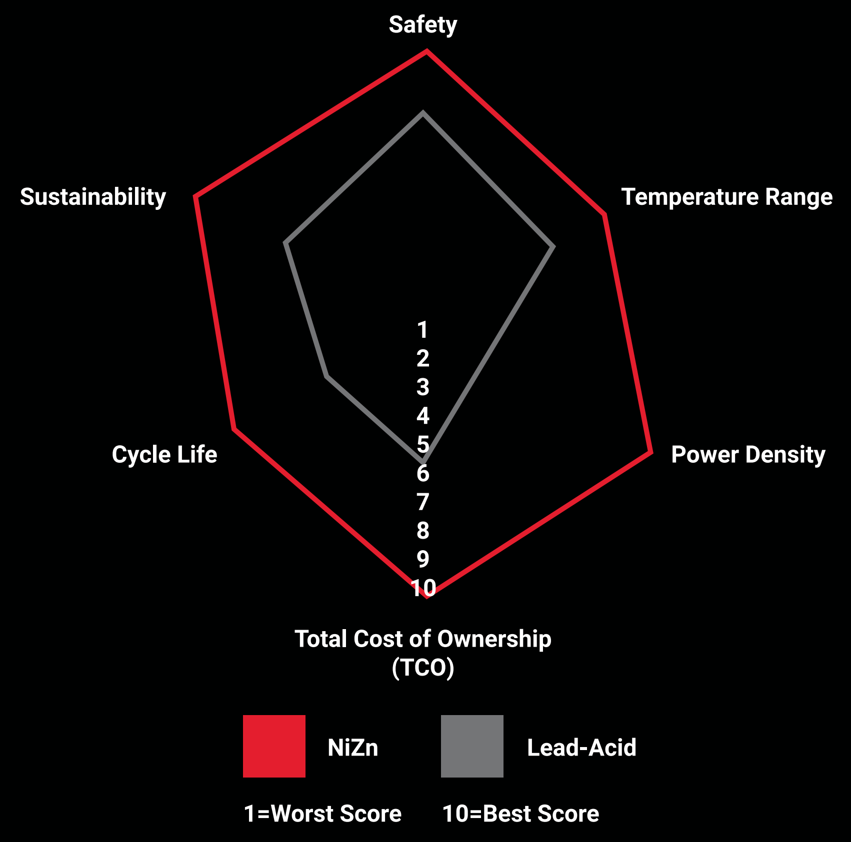
Nickel-zinc (NiZn) now allowed

2025 NFPA 110
The battery shall be nickel-cadmium, lead-acid, nickel-zinc, lithium-ion, or other stored energy technology capable of providing sufficient established prime mover cranking cycles.

2022 NFPA 110
The battery shall be of the nickel-cadmium, or lead-acid type

NICKEL-ZINC STARTING BATTERIES

- Optimized for high discharge current applications
  - Data center UPS
  - Engine Starting
- Deliver reliable performance, safely
  - High engine-cranking performance even at low state-of-charge
  - Much more efficient use of battery capacity compared with lead-acid
- Sustainable
- Low lifetime cost of ownership



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NICKEL-ZINC VS LEAD-ACID COMPARISON

Nickel-zinc Batteries

15-year service life

No battery maintenance
96% lower lifetime GHG emissions
70lbs

Lead-acid Batteries

Replacement every 24-30 months

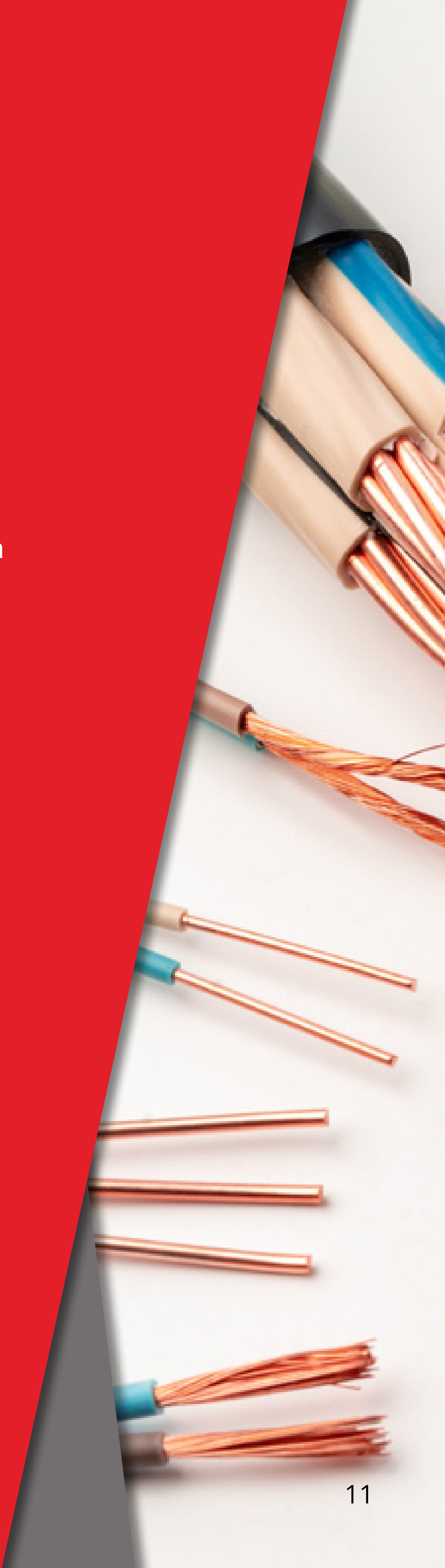
Regular maintenance every month
560lbs

*Batteries shown at relative scale

CHANGE #4 - EPSS START SIGNAL NEW FOR 2025

5.6.5.9 – Level 1 Compliance

1. "The integrity of the EPS start signal circuit from a remote device such as an ATS or paralleling control shall be monitored for broken, disconnected, or shorted wires."
2. "A broken, disconnected, or shorted start signal circuit shall start the EPS"



CHANGE #5 - 8.1.3 - RELIABILITY CENTERED MAINTENANCE

NEW FOR 2025: NFPA 110 Standard allows for reliability-centered maintenance

8.1.3 – "Reliability centered maintenance shall be permitted"

3.3.16 – Reliability-Centered Maintenance (RCM)
A logical, structured framework for determining the optimum mix of applicable and effective maintenance activities needed to sustain the operational reliability of systems and equipment while ensuring their safe and economical operation and support.

8.1.3 WHAT IS RCM? MAINTENANCE FOR RELIABILITY

1. What is the item supposed to do and its associated performance standards?
2. In what ways can it fail to provide the required functions?
3. What are the events that cause each failure?
4. What happens when each failure occurs?
5. In what way does each failure matter?
6. What systematic task can be performed proactively to prevent, or to diminish to a satisfactory degree, the consequences of the failure?
7. What must be done if a suitable preventive task cannot be found?

8.1.3 RCM NOTES

NFPA 110 2025 - A.8.1.3

Reliability maintenance is an umbrella strategy and decision-making process that analyzes systems and assets, defines their design function, and determines their risk and/or criticality to the organization and operation of the facility.

Through a risk analysis process focused on the system and asset failure modes and their potential consequences, RCM aims to optimize the maintenance strategy to apply the most effective maintenance approach for each system and asset. The goal is to develop a comprehensive maintenance program that maximizes system and asset reliability, minimizes downtime, and optimizes maintenance costs for the organization.

For additional information, see NFPA 70B, Annex 1.

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8.3.6 – STARTING & CONTROL BATTERY MAINTENANCE

2022 NFPA 110 Required Weekly Battery inspections for lead-acid and NiCd batteries

"Additional monthly testing required for lead-acid batteries by either:

1. Recording of electrolyte specific gravity or
2. Battery conductance"

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CHANGE #6 - 8.3.6 – STARTING & CONTROL BATTERY MAINTENANCE

2025 NFPA 110 – 8.3.6.1

Required weekly inspection of batteries and monthly battery testing for all Level 1 facilities

- For ALL batteries, not just lead-acid batteries

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CHANGE #5 - 8.1.3 - RELIABILITY CENTERED MAINTENANCE

New for 2025: the division of batteries between maintainable/non-maintainable and the addition of two testing methods

Maintainable Batteries (access to electrolyte)

- Electrolyte-specific gravity
- Conductance testing
- Ohmic testing

Carbon pile load testing

Cranking voltage drop testing

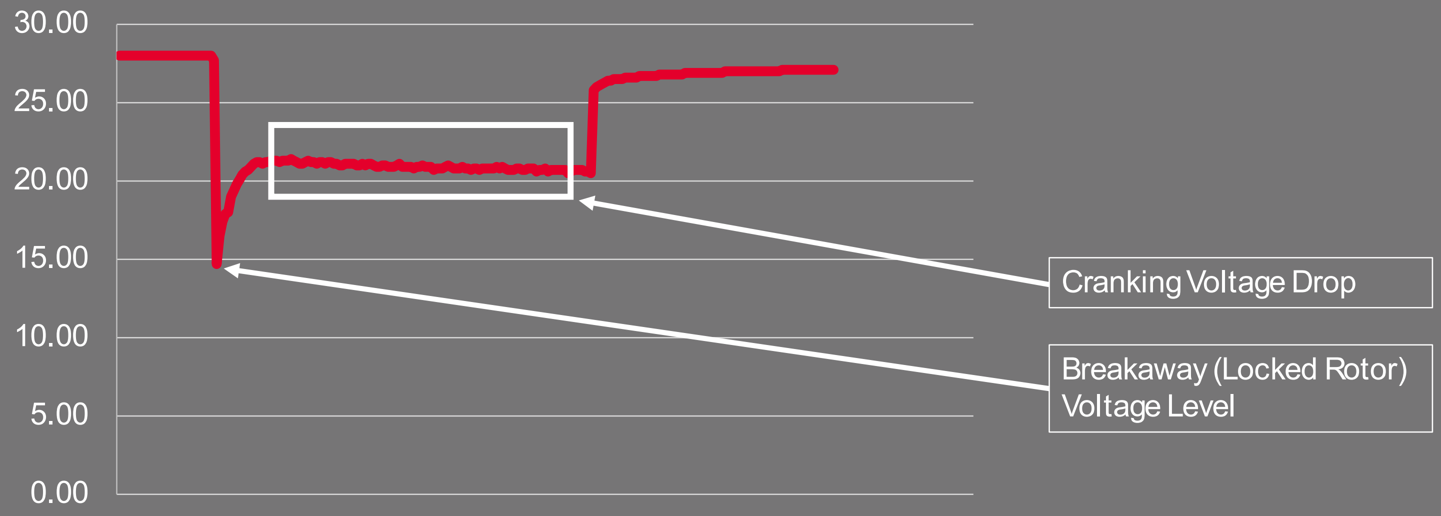
Not Maintainable Batteries (no access to electrolyte)

- Conductance testing
- Ohmic testing

Carbon pile load testing

Cranking voltage drop testing

CRANKING VOLTAGE DROP



A.8.3.6.1.2 - CRANKING VOLTAGE DROP REQUIREMENTS

- A.8.3.6.1.2 - Priority should be given to the education and training of individuals regarding potential safety hazards when choosing the appropriate battery test
- Table A.8.3.6.1.2(4) Initial Cranking Voltage Drop for Starter Viability

Temp. [°C (°F)]	21.1 (70)	15.6 (60)	10 (50)	4.4 (40)	−1.1 (30)	−6.7 (20)	−12.2 (10)	−17.8 (0)
Min. Volts (12 VDC)	9.6	9.5	9.4	9.3	9.1	8.9	8.7	8.5
Min. Volts (24 VDC)	19.2	19	18.8	18.6	18.2	17.8	17.4	17

Questions?

Contact our Engine Starting experts
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