

Table 9.2 Electrochemical ESS Technology-Specific Requirements

Compliance Required	Battery Technology					Other Electrochemical ESS and Battery Technologies ^b	Reference
	Lead-Acid	Nickel ^a Ni-Cd, NiMH, Ni-Zn ^a	Lithium-Ion	Flow	Sodium Nickel Chloride		
Exhaust ventilation	Yes	Yes ^c	No	Yes	No	Yes	Section 4.9
Spill control	Yes ^d	Yes ^d	No	Yes	No	Yes	Section 4.14
Neutralization	Yes ^d	Yes ^d	No	Yes	No	Yes	Section 4.15
Safety caps	Yes	Yes	No	No	No	Yes	Section 9.4
Thermal runaway	Yes ^e	Yes ^e	Yes ^f	No	Yes ^f	Yes ^f	Section 9.3
Explosion control	Yes ^g	Yes ^g	Yes	No	Yes	Yes	Section 4.12
Size and separation	Yes	Yes	Yes	Yes	Yes	Yes	Section 4.6

^aNickel battery technologies covered in this column ~~include are~~ nickel cadmium (Ni-Cad), nickel metal hydride (Ni-MH), and nickel zinc (Ni-Zn).

^bThe protection in this column is not required if documentation acceptable to the AHJ, including a hazard mitigation analysis complying with 4.1.4, provides justification that the protection is not necessary based on the technology used.

^cExhaust ventilation is not required for nickel metal hydride batteries.

^dApplicable only to vented- (~~i.e.g., flooded-~~) ~~type nickel and lead-acid~~ batteries.

^eThermal runaway protection is not required for vented (e.g., flooded) lead-acid ~~and Ni-Cd~~ batteries.

~~The t~~Thermal runaway protection is permitted to be ~~provided by the part of a battery or capacitor~~ management system that has been evaluated ~~with the battery~~ as part of the ~~evaluation to~~ UL 1973 or UL 9540 ~~listing~~.

^gExplosion control is not required for the following:

- (1) Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76
- (2) Lead-acid and nickel-cadmium battery systems designed in accordance with IEEE C2 and used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility located in building spaces or walk-in units used exclusively for such installations
- (3) Lead-acid battery systems in uninterruptible power supplies listed and labeled in accordance ~~with the application with UL 1778,~~ utilized for standby power single cabinet in a single fire area in buildings or walk-in units



First Revision No. 114-NFPA 855-2020 [Section No. 9.2]

[See attached Word doc for table changes.]

9.2 General.

Electrochemical ESS shall comply with the applicable sections of Chapters 4 and 9 as specified in Table 9.2.

Table 9.2 Electrochemical ESS Technology-Specific Requirements

Compliance Required	Battery Technology				Other Electrochemical ESS and Battery Technologies^b		Reference
	Lead- Acid	Nickel^a	Lithium- Ion	Flow	Sodium Nickel Chloride		
Exhaust ventilation	Yes	Yes ^c	No	Yes	No	Yes	Section 4.9
Spill control	Yes ^d	Yes ^d	No	Yes	No	Yes	Section 4.14
Neutralization	Yes ^d	Yes ^d	No	Yes	No	Yes	Section 4.15
Safety caps	Yes	Yes	No	No	No	Yes	Section 9.4
Thermal runaway	Yes ^e	Yes	Yes ^f	No	Yes ^f	Yes ^f	Section 9.3
Explosion control	Yes ^g	Yes ^g	Yes	No	Yes	Yes	Section 4.12
Size and separation	Yes	Yes	Yes	Yes	Yes	Yes	Section 4.6

^aNickel battery technologies covered in this column include nickel cadmium (Ni-Cad), nickel metal hydride (Ni-MH), and nickel zinc (Ni-Zn).

^bThe protection in this column is not required if documentation acceptable to the AHJ, including a hazard mitigation analysis complying with 4.1.4, provides justification that the protection is not necessary based on the technology used.

^cExhaust ventilation is not required for nickel metal hydride batteries.

^dApplicable only to vented- (i.e., flooded-) type nickel and lead-acid batteries.

^eThermal runaway protection is not required for vented (e.g., flooded) lead-acid batteries.

^fThe thermal runaway protection is permitted to be part of a battery management system that has been evaluated with the battery as part of the evaluation to UL 1973 or UL 9540.

^gExplosion control is not required for the following:

- (1) Lead-acid and nickel-cadmium battery systems less than 50 V ac, 60 V dc in telecommunications facilities for installations of communications equipment under the exclusive control of communications utilities located in building spaces or walk-in units used exclusively for such installations that are in compliance with NFPA 76
- (2) Lead-acid and nickel-cadmium battery systems designed in accordance with IEEE C2 and used for dc power for control of substations and control or safe shutdown of generating stations under the exclusive control of the electric utility located in building spaces or walk-in units used exclusively for such installations
- (3) Lead-acid battery systems in uninterruptable power supplies listed and labeled in accordance with UL 1778, utilized for standby power applications, and housed in a single cabinet in a single fire area in buildings or walk-in units

Supplemental Information

<u>File Name</u>	<u>Description</u>	<u>Approved</u>
FR_114_Table_9.2.docx	Revised table 9.2 from FR-114 - for staff use	✓

Submitter Information Verification

Committee: ESS-AAA

Submission Date: Fri Nov 20 15:07:52 EST 2020

Committee Statement

Committee Statement: The nickel technologies covered in the “Nickel” column were identified in the table heading to clarify that other nickel technologies aren’t covered by this column. Footnote a is retained to describe the abbreviated references.

In footnote d, all vented batteries with free-flowing electrolyte need to be provided with spill control and neutralization.

Vented Ni-Cd was added to footnote e because of the history and to keep it in conformance with other fire codes.

The revised wording in footnote f is provided to avoid confusion as to the application.

In footnote g(3), the application of UPS for ESS services may be listed to other standards.

Size and separation requirements are applicable to all battery and capacitor ESS technologies, and do not need to be referenced in this table. Any exceptions (and carve outs) will be included in that section since they are not technology specific.

Response Message: FR-114-NFPA 855-2020

[Public Input No. 185-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 497-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 557-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 325-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 358-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 465-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 220-NFPA 855-2020 \[Section No. 9.2\]](#)

[Public Input No. 295-NFPA 855-2020 \[Section No. 9.2\]](#)