BESS – Rules and Codes

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Title 3 of the Rules of the City of New York
Section 608-01 “Outdoor Stationary Storage Battery Systems”

NFPA 855 “Standard for the Installation of Stationary Energy Storage Systems”

International Fire Code – Batteries

One of the goals of Rules / Codes is to establish requirements for the design so hazards are mitigated

BESS hazards are Explosions, Severe Fire, chemical hazards, electrical hazards and physical hazards

The focus is on the design to mitigate hazards

- using lab validated test data to engineer a system
- using listing criteria (such as distance criteria) to be used without engineering

The design principles to mitigate hazards is the same for the Rule or NFPA 855 or IFC

The FDNY rule covers only outdoor installations, therefore only NFPA 855 outdoor requirements are covered here. IFC coverage of batteries is similar to NFPA 855, so is not being covered in this presentation

In FDNY's rule hazards (sizes) are mentioned as

small	>2 kWh <70/20 kWh
medium	>70/20 kWh and < 250/500 kWh
or large	>250/ 500 kWh

3 RCNY 608-01 "The Rule"

(c)(7)(A) **Listing**

All BESS must be listed
UL 1741-Inverters, UL 1973 Batteries, UL 9540 Energy Storage systems

(c) (7) (B) **Full Scale Testing**

UL 9540A test standard
or other approved standard or test data

Lead Acid	Large	Approved Test Data if not, Data from UL 9540A Test
NiCd	Large	As mentioned above
Ni MH	Large	As mentioned above
Flow	Large	As mentioned above
Li Ion	Small Medium and Large	Data from L 9540A Test for all

(d) **Equipment approval**

All BESS technologies and sizes need equipment approval	Not necessary if tested and listed by a nationally recognized lab with installation conditions Or Listed based on approved test data that hazards are mitigated
Large Installations	Not necessary if full scale tested in a non standard configuration and field tested to UL9540 or other approved standard

(g) (1) **Location and Construction**

Separation distance
10 feet minimum

Distance required as per equipment approval

Based on analysis using full scale testing data that shows exposures will not be affected

(h) (3) **Fire Extinguishing System**

Not necessary for small or medium installations

Only if it is a condition of product approval

Required for all large installations

(h) (4)

Explosion mitigation to NFPA 68 and NFPA 69

Small and medium	not required	only if it is a condition of equipment approval
Large	required	based on data collected from full scale testing

Installation Approval

File plans with the Dept of Buildings (if applicable) – Form PW 1

File plans with FDNY – Tech Management – Form TM 1

- Equipment approval
- Site plan
- Commissioning and Decommissioning Plan
- Other plans/ analysis such as suppression, fire alarm, fire detection gas detection, ventilation, explosion analysis
- Adequacy of water supply
- Central station connection
- Smoke/Gas purge from the enclosure

Operation and Maintenance

Systems shall be remotely monitored (BMS) continuously and data being generated interpreted. This person should be available to the responding Chief over the phone

Certificate of Fitness Holder to respond to the site in 15 minutes to provide technical assistance to the responding Chief

Other Technologies

Size thresholds (Hazard size) are not mentioned
Note: Lead acid and Li-Ion are being treated differently in the rule

Will depend on the listing and test data obtained from a nationally recognized laboratory

AHJ will decide based on the above

NFPA 855

(International Fire Code – Batteries is similar to 855)

Probably will be used in most jurisdictions outside New York City

NFPA 855

4.1.2.1.3 (1)	Large Scale test data in accordance with UL 9540A or equivalent test standard
4.1.2.1.3 (3)	Calculation or modeling to determine compliance with NFPA 68 or 69

Equipment listing

All BESS must be listed

Some exception for lead acid batteries to be listed to 9540

4.4.3 Outdoor Installations (855)

Remote location	100 feet from building or hazardous material
Near exposures	When not as above
Also categorized as	Walk in enclosures and Non- walk in enclosures

Table 4.4.3 Clearance to Exposures (855)

10 feet from stated exposures

3 feet	if a 1 hour barrier is provided
3 feet	where large scale testing demonstrates fire in enclosure will not generate radiant heat flux sufficient to ignite stored material

4.4.3.4 **Means of Egress (855)**

10 feet from means of egress

3 feet where large scale testing will show no impact on means of egress

4.6 **Size and Separation (855)**

Groups of 50 kWh with
3 feet from other groups

Larger groups smaller spacing based on large scale testing

4.11 Fire Control and Suppression (855)

	For outdoor walk in units	NFPA 13	0.3 gpm/sq.ft
			Alternate density based on large scale fire testing
4.11.3.1	Other non water based systems		Based on large scale fire testing
4.11.7	No suppression system if installed in open parking garages		Full scale testing to show that there is no exposure hazard to parked vehicles
4.11.9	No suppression for walk in enclosures		Full scale testing to show that egress is not compromised

4.12.1 **Explosion mitigation (855)**

For walk in units deflagration venting to NFPA 68 or explosion prevention to NFPA 69	To be based on full scale test data

Thank You

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