	FIRE MARSHAL'S OFFICE — PLAN REVIEW GUIDELINE	
	SUBJECT: Stationary Lithium Ion Battery Energy Storage Systems Plan Review	
	VERSION: 1.0	DATE: October 17, 2023
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2021 International Fire Code (IFC) Section 1207 provisions are applicable to electrochemical storage systems ≥ 20 kWh. Austin Fire Department is responsible for the permitting and inspection of Stationary Lithium Ion Battery Energy Storage Systems (LiBESS). This guideline was prepared to assist design, construction and commissioning personnel when preparing design drawings and specifications to obtain a building permit for a stationary LiBESS.

If the sum nameplate ratings of one or more stationary LiBESS > 600 kWh, contact AFD to schedule a Preliminary Design Review meeting. (Section 1207.5.2)

See Table 1207.1.1 (City of Austin amendment) for flooded and valve regulated battery requirements.

This guideline includes relevant provisions from the adopted Building and Electrical codes:

- 2020 National Electrical Code (NEC)
- 2021 International Building Code (IBC)

REQUIRED COMMERCIAL BUILDING INFORMATION

1. Provide documentation demonstrating the ESS is listed in accordance with UL 9540, *Energy Storage Systems and Equipment*. (Section 1207.3.1, NEC 706.5)
2. Provide documentation that the cells in the stationary LiBESS are new and listed in accordance with UL 1973, *Standard for Batteries for Use in Stationary, Vehicle Auxiliary Power, and Light Electric Rail (LER) Applications* or UL 1989, *Standard for Standby Batteries*.
3. If second-life lithium ion cells are used to assemble the LiBESS, provide documentation demonstrating the equipment was repurposed or refurbished in accordance with UL 1974, *Standard for Evaluation of Repurposed Batteries*. (Section 1207.3.9)
4. Illustrate the location of the LiBESS room in relation to the building's lowest level fire department access, and location and arrangement of the LiBESS in the room where it is to be installed. (Section 1207.1.3, item 1). The location of the room shall be located ≤ 20 feet above the lowest level of fire department vehicle access and shall not be located below the lowest level of exit discharge. (Section 1207.5.3 –City of Austin amendment)
5. Rooftop stationary LiBESS are limited to buildings ≤ 30 feet above the lowest level of fire department vehicle access. (Section 1207.9.1 - City of Austin amendment.
6. Provide the energy capacity of each stationary LiBESS. An individual LiBESS maximum energy capacity is 50 kWh. When a room or enclosure has more than one stationary LiBESS, the plan(s) shall specify 3 feet or greater separation from prescribed exposures. For LiBESS > 50 kWh or separation distances are reduced, the required separation will be based on the UL 9540A data for the specified ESS. (Section. 1207.5.1)
7. For LiBESS storing ≥ 20 kWh energy, the required working clearances prescribed by the NEC and the manufacturer installation instructions shall be included in the design sheets. (Section 1207.4.2, 2020 NEC 760.20 (C))
8. For indoor LiBESS installations, indicate if the building is designed for a Dedicated-Use or Nondedicated-Use. (Section 1207.7)

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9. Provide the fire-resistance ratings of fire-resistive rated construction enclosing the LiBESS. (Section 1207.7.4)
10. Indicate the location of the egress doors. Egress door hardware for ESS rooms containing electrical equipment rated ≥ 800 amperes shall be provided with listed fire exit or panic hardware. (IBC Section 1010.2.9.2)
11. Provide the manufacturer of cells and the cell anode material. (Section 1207.3.9, item 3)
12. Provide the LiBESS kW rating, the nameplate input and output voltages, and amperage. (Section 1207.3.9, item 4; 2020 NEC 706.9)
13. Provide the manufacturer data sheet, voltage and amperage ratings, and operating sequence of the energy storage and management system (ESMS) to disable the LiBESS based on under-voltage, over-voltage, increased temperature within a cell, and other conditions that can initiate thermal runaway. The design sheets shall demonstrate compliance with 2020 NEC 706.33. (Sections 1027.3.2 & 1207.1.3, item 5)
14. Provide manufacturer documentation demonstrating the ESS will not emit Toxic or Highly Toxic gases when charged, discharged and during normal use. (Section 1207.4.7- City of Austin amendment)
15. Indicate the location of required signage. The display location, text, color and prescribed information for required signage prescribed by 2021 IFC Sections 1207.4.1, 1207.4.8 and NEC 706.15 (C). (Section 1207.3.9, item 6)
16. Provide the LiBESS commissioning and decommissioning plans. (Section 1207.1.3, items 9 & 10) The decommissioning plan shall address if Fire Mitigation Personnel who will perform prescribed actions after a fire event, when required by AFD. (Section 1207.1.6.1 - City of Austin amendment).

REQUIRED FIRE PROTECTION ESS TECHNOLOGY SPECIFIC REQUIREMENTS

17. **Fire detection (Section 1207.5.4 – City of Austin amendment).** The location of the fire alarm control panel and annunciator (if required) shall be included in the design sheets.
18. **Fire protection (Section 1207.5.5).** Wet-pipe, dry-pipe, single-interlock, or double-interlock pre-action sprinklers are permitted. Reductions in the prescribed design density and design area shall be based on the UL 9540A report for the specified LiBESS. Alternative automatic fire-extinguishing systems will only be considered if specifically addressed in the LiBESS manufacturer's UL 9540A report and Section 903.1.1.
19. **Mechanical exhaust ventilation (NEC 760.30 & Section 1207.6.1).** The determination as to if mechanical exhaust ventilation is required will be based of the volume and species of gas emitted during thermal runaway and the volume of the room or enclosure. Gas emission data shall be based on the UL 9540A report for the specified LiBESS at the Cell, Module, or Unit level tests.
20. **Explosion control (Sections 911.1 & 1207.6.3).** Design sheets shall establish when explosion control is required. Gas emission data shall be based on the UL 9540A report for the specified LiBESS at the Cell, Module, or Unit level tests. If mechanical exhaust ventilation is employed as the explosion control method, the design shall be based on NFPA 69.

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21. **Thermal runaway detection system (Sections 1207.6.5 & 1207.6.6 – City of Austin amendment).** The thermal runaway detection shall meet the performance requirements and is independent of the ESMS. This system shall be included in the shop drawing submittal for the fire detection system.

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