OFFICE OF THE ILLINOIS STATE FIRE MARSHAL

JB Pritzker, Governor
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Illinois Pollution Control Board
60 East Van Buren Street, Suite 630
Chicago, Illinois 60605

RE: Office of the State Fire Marshal's Feedback on Proposed EV Battery Storage Rules, docket number R26-17

Thank you for notifying the Office of the State Fire Marshal (OSFM) of the proposed rules on this topic. We have reviewed the proposed rules and are sharing our responses for consideration. Please note that our review was limited to the language contained in the proposed rules; we did not conduct a concurrent review of the underlying statute. Our comments are therefore directed solely at rule text as presented. We believe there are some possible changes that may improve the overall safety environment.

Our comments also reference ongoing development of NFPA 800 (Battery Safety Code), relevant provisions of the International Fire Code (2024), and research-based guidance such as FM Global Data Sheet 7-112 and NFPA codes 13, 72, 101, and 855, particularly as they relate to factors such as state of charge limitations, storage configuration and height, explosion/deflagration analysis, sprinkler and detection system design, egress remoteness, and the role of qualified fire protection professionals.

We also raise implementation considerations around the need for specialized expertise to support local fire departments. Our goal in providing this review of the proposed rules is to ensure the final rules provide clear, enforceable, and technically sound requirements that reflect the evolving hazards associated with used EV battery storage while enhancing overall life safety and property protection. Please see below for more detailed information. Please let us know if you have any questions.

NFPA 800, Battery Safety Code:
Please be aware that the NFPA is developing NFPA 800, *Battery Safety Code*, which is on the "fast" route for development, and which could be a suitable basis, support, or replacement for portions of these rules in this subject area, depending on timing considerations. NFPA 800 has completed a first round of public comment (there is only one round for a provisional standard) and is expected to be finalized later in 2026.

FM Loss Prevention Data Sheet 7-112, Lithium-Ion Battery Manufacturing and Storage:
Additionally, some of our suggestions have a basis in FM Loss Prevention Data Sheet 7-112, Lithium-ion Battery Manufacturing and Storage (FM 7-112) (available free of charge at https://www.fm.com/resources/fm-data-sheets), which offers some well-researched guidance on how to address this topic. We believe it could also be a helpful resource.

State of Charge:
We offer the general consideration that limiting "state of charge" of batteries has been indicated as an important consideration alongside other components (e.g. sprinkler protection, protecting the enclosure, limiting storage, separating combustibles). We believe it would be appropriate for staff to consider FM 7-112 and FM Data Sheet 8-1 Commodity Classification (FM 8-1) as they relate to the state of charge of batteries. We would further suggest consideration of additional language in the rules relating to having the stored batteries not be charged or having been drained of charge before they are placed into storage, limiting the potential issues from having charged batteries that could contribute power/ignition and spark the beginning of a fire.

Incorporation of NFPA 51B:
Under Section 1220.205(a)(5), the proposed rulemaking states:

5) All activities at the used EV battery storage site that present a risk of fire must be conducted in accordance with the NFPA 51B standard for fire prevention, including but not limited to welding, cutting, and other hot work, and either:

A) Outside of any room in which used EV batteries are placed or accumulated; or

B) If outdoors, separated by at least 250 feet from all containers in which used EV batteries are placed or accumulated.

We would inquire on the use of a topic-limited standard. There are other activities that can present challenges to EV battery storage that would have their own fire prevention and safe practices requirements. We also note that the document states much was taken from NFPA 855, but NFPA 51B, *Standard for Fire Prevention During Welding, Cutting, and Other Hot Work*, is not one of the mandatory referenced standards of NFPA 855. It is our understanding that many local jurisdictions have adopted the International Fire Code (IFC). The IFC would offer a broader range of fire prevention methods not so narrowly configured to "welding, cutting, and hot work" as NFPA 51B. Perhaps the International Fire Code could be included to set standards for preventing fires more generally? The International Fire Code (2024) offers the following that can be considered for referencing:

1. Section 320, Lithium-Ion and Lithium Metal Battery Storage
2. Section 322, Micromobility Devices
3. Section 403.10.6 Emergency Planning and Preparedness for Lithium-Ion Batteries

If the Board chooses to maintain the reference to NFPA 51B rather than utilizing the International Fire Code, we note that the 2014 edition of NFPA 51B, which is incorporated by reference, has been succeeded by both the 2019 and 2024 editions. We would request consideration of the adoption of a more recent edition. Updated editions of NFPA standards typically incorporate options for newer technology and revise requirements based on incidents that have occurred between editions, providing higher levels of safety overall.

Explosion Protection and Deflagration:
Under Section 1220.205(a)(9), there are requirements for explosion protection. We appreciate that this language appears to be based on requirements of NFPA 855. We would suggest specifying that the hazard/deflagration analysis be prepared by a Fire Protection Engineer or registered design professional with expertise in fire protection engineering or a similarly qualified individual. By specifying the involvement of someone well-qualified to perform the analysis, it helps ensure that the evaluation and design of the system to be installed is of sufficient quality such that the installed explosion protection will meet industry standards.

Racks and Height of Storage:
Section 1220.210(c) contains, in part, the following language. We suggest the addition of the underlined language, based partially on FM 7-112.

c) All used EV batteries stored within a building must comply with the following:

#) Used EV batteries shall not be stored on racks.

1) Used EV batteries stored indoors shall be stored in piles of no greater than one pallet high and no more than 900 square feet in area. Each pile must be separated from other piles and from the remainder of the building areas by walls as described in subsection (c)(2) and by a ceiling with a 2-hour fire resistance rating constructed in accordance with the local building code.

Height limitation is important as it could help keep the fire load to a manageable situation for both the fire protection systems and the responding firefighters. Section 1220.210(c)(7)) allows storage up to within two feet of a ceiling. Warehouses can be 20, 30, or even 40 feet in height. Tall towers of materials are incredibly challenging for sprinkler systems and for on-the-ground firefighting. We suggest that language be added that limits the height to essentially one pallet load and that also does not allow storage on racks. This will help to limit the height and the dangers involved due to storing at height. These rules should consider nationally recognized design for storage of these batteries which is based on large-scale testing, specifically FM 7-112, which includes this height limitation. Storage arrangement design cannot be independent of the fire protection design and fire service needs.

Smoke Detector Installation:
Section 1220.210(c)(4) contains the following language. We suggest the addition of the underlined language to establish the standard of work for installation.

4) Rooms where used EV batteries are stored shall contain a fire alarm system activated by an air-aspirating smoke detector system, installed in accordance with NFPA 72, National Fire Alarm and Signaling Code, or a radiant-energy detection system with occupant notification.

Currently, Illinois' regulations related to fire alarm design and who is qualified to install these systems are not as comprehensive as would be beneficial. Specifying NFPA 72, a nationally used code, provides standards for installation, avoiding issues of a sub-standard installation which would meet the language of the proposed rules but be insufficient to meet the purpose of the proposed rules (e.g. a fire alarm system that is activated by an air-aspirating smoke detector system which has improperly arranged, wired, or otherwise inadequate installation). This also

has the benefit of reducing confusion and creating clarity for the regulated entities. This may also require a change in the incorporations by reference.

Sprinkler System Design:
Section 1220.210(c)(5) contains the following language. We suggest the addition of the underlined language.

5) Rooms where used EV batteries are stored shall contain an automatic sprinkler system designed and installed as determined by an analysis performed by a Fire Protection Engineer or registered professional with expertise in fire protection engineering or similarly qualified individual.

We suggest that a design standard be specified or design requirements be included as a lack of specificity may create issues. Without specificity on the design of the sprinkler system, one could install a sprinkler system designed to protect an office building (low hazard) and have the room "contain an automatic sprinkler system," but one with insufficient capability to respond to a battery fire (high hazard). Having someone well-qualified to analyze and design a system for the storage site helps limit the possibility of insufficient fire suppression. FM 7-112 has specific design standard requirements for returned/defective/off-specification/damaged cells/modules/batteries, which could be utilized. NFPA 13 contains standards for high hazard systems and permits alternative designs established through large-scale testing by a National Recognized Testing Laboratory (NRTL). Depending on timing, the coming NFPA 800 may also contain requirements.

Remoteness of Egress:
Section 1220.210(c)(6) contains the following language. We suggest the revision of the language to address "remoteness" of egress.

6) All rooms where used EV batteries are stored shall have no fewer than 2 points of access that are sufficiently separated from one another to provide 2 independent means of ingress and egress during a fire event.

The proposed language does not include the requirement that all the model codes have for remoteness of two means of egress to make sure that a fire or emergency located in the vicinity of one means of egress will not prevent the other means of egress from being used. While perhaps the intention of "sufficiently separated" may have been meant to address this, the language also does not address how to determine sufficient separation. There are specific requirements found in NFPA 101, *Life Safety Code*, and the International Building Code (IBC) related to measurement and calculation of that separation. We offer that the revision to "…shall have no fewer than 2 means of egress that are remotely located consistent with NFPA 101/IBC." could be very helpful in ensuring that there is clarity for what is needed for two means of egress.

Local Fire Department Impact:
Section 1220.210(d) sets a condition that if more than 5,000 kilograms (11,023 pounds) of used EV batteries are located at the battery storage site, the owners and operators of the site must

"Develop, in consultation with the local fire department, a battery storage plan for all used EV batteries that are stored within any building."

We appreciate and value our local fire service, and we are also aware that many local departments, particularly smaller, rural, and volunteer departments, will not be equipped to offer adequate guidance. Nor is OSFM an expert entity in these matters. We would suggest that experts (such as fire protection engineers) should also be involved as they can offer instruction to the local FD and provide advice for approaching emergencies. If an expert is not automatically included, perhaps a fire protection engineer can be required to be included in discussion if the fire department requests it (at no cost to the fire department). There may be other methods to have support available to local entities without the necessary knowledge to provide consultation to the owners/operators on this particular subject area.

Sprinkler System Capability Assumption:
While not necessarily on the content of the proposed rules, we would respectfully offer that the statement *"It is anticipated that most facilities will already have compliant sprinkler systems and would be able to easily expand their smoke or thermal detection systems as needed with low costs"* may represent an inaccurate assessment, as appropriate sprinkler design for battery storage is still being researched and developed, especially when it pertains to storage arrangements. NFPA 855, *Standard for the Installation of Stationary Energy Storage Systems*, only provides design criteria for battery energy storage system (BESS) structures. Research is continuing for the warehousing of returned/defective/off-specification/damaged cells/modules/batteries – storage batteries, which these rules address. FM 7-112 is a well-researched source that provides requirements for their insured facilities that are manufacturing and storing returned/defective/off-specification/damaged cells/modules/batteries. FM 7-112 requires a design density of 0.3 gpm (gallons per minute) per 2500 ft^2 for the sprinkler system, which is equivalent to design for an Extra Hazard Group 1 classification from NFPA 13, *Standard for the Installation of Sprinkler Systems*. This design requires a substantial amount of water which is not normally found in your average sprinklered warehouse. This could require upgrades to the sprinkler system to appropriately address the higher level of hazard, such as larger fire pumps and larger water supplies (municipal pipe size adjustments or tank storage).

Upgrading or installing fire alarm systems to include what these rules require may also have a relatively higher cost. These rules appropriately require aspirating smoke detection or radiant energy system detection, but this technology is very specialized and can be expensive.

We are happy to answer questions and provide additional information to technical staff. Thank you for your consideration.