

FINAL

The Commission to Advance Lithium-Ion Battery Safety in Maryland; HB468/CH950

Thursday, April 10, 2025 · 10:00am – 12:00pm

Time zone: America/New York

Google Meet joining info

Video call link: <https://meet.google.com/jyn-dios-cdt>

Or dial: (US) +1 929-276-0978 PIN: 675 047 767#

More phone numbers: <https://tel.meet/jyn-dios-cdt?pin=5676828275144>

Commission members attending the meeting in person were marked present as follows: Chairman Emil Nusbaum, Vincent Baker, Ivan Browning, Michael Cox, Kitty McIlroy, Chris Pilzer, Justin Short and DeAndre Wilson,

Commission members attending the meeting virtually were marked present as follows: Taiwo Alo, David Black, Marc Boolish, Haley Kotzker, Garrett Fitzgerald, Christopher Neidhart, and Ginny Rogers

Absent Commission Members: Jeffrey Donohue, Nicholas Rodricks, and **Tessa Sanchez**, Robert Whittlesey

Members of the public were in attendance.

Staff in attendance: **Ken Bush, MSP** and **Penny Doty, MSP**

Presenters: Mike Simpson, AES Clean Energy.

The meeting was called to order by Commission Chairman Emil Nusbaum at 10:04 a.m. Chairman Nusbaum welcomed everyone and provided the attendees with a mission synopsis of the Commission. Chairman Nusbaum reported the General Assembly has mandated that the Commission compile recommendations and standards to reduce the risk of thermal events extending from lithium-ion batteries in order to protect the public. The Commission is reviewing best practices, policies and standards for mid to small formats, EVs and large format battery systems, with extension to producer responsibility policy. The final recommendations must be compiled in a final report and submitted to the Maryland General Assembly by the end of December 2025.

Roll call was completed by the Commission staff. Staff confirmed there was a majority present.

Commissioner Ken Bush provided the Commission with an update regarding the State's adoption of the 2024 version of NFPA 1 Fire Code and NFPA 101 Safety Code for which both of the NFPA Codes reference the most current 2023 NFPA 855 Codes. Commissioner Bush reported that a second public hearing was held by the State Fire Prevention Commission on March 31, 2025. There were no new public comments received as part of that hearing. The only previous public comments that have been received, besides the introductory comments at the initial hearing on March 10, 2025, was a written letter sent in support of the high-rise sprinkler issue. The next step in the process would be that the State Fire Prevention Commission would consider the proposed amendments and changes, and vote on a final version of the update at their regularly scheduled meeting on April 17, 2025.

Chairman Nusbaum introduced the first guest speaker/presenter, Mike Simpson, Director of Innovation Solutions from AES Utility Scale Battery Energy Storage Systems (BESS) Safety in Maryland. Presenter Simpson's presentation highlights are summarized as follows (notes compliments of Commissioner Justin Short with PowerPoint presentation slides pdf available for review upon request).

- Operate facilities in HI, CA, AZ, Northeast; have battery storage systems in just about every state, also developing in Central and South America.
- 2008: deployed first utility-scale storage in Indianapolis, first commercially operated in Chile.
- 2017: launched Fluence in coop with Siemens: global initiative.
- +1.3 gigawatts of storage in US, 2 gigawatts under construction.
- Charges when energy demand low, provides during peak, improves reliability & efficiency: levels out the system without bringing secondary generators online.
 - Also, can assist with constrained transmission loads if sited properly.
 - Solar creates surplus during mid-day, needed for evening rebound in demand, allows to prevent ramping facilities.
- Li-ion dominant player
 - Invented in 1990s, started in aerospace (high power requirements, price made sense) > consumer electronics > EV > stationary storage.
 - EV market was 10 times usage to storage, but shifting.
 - Economy of scale is making economically effective for storage.
 - Better energy density, longer life cycle, less degradation.
- Safety issues have ramped for storage: more units tightly arranged in enclosed area.
- MD SB 937: Fifteen (15) year competitive solicitation at BPU for 1,600 MW of utility scale BESS projects.
- Energy Storage Hazards
 - Can be millions of cells in a single plant.
 - Stranded Energy: uncommon in many other systems.
 - If discharge down to zero, can't be recharged, so requires some charge all the time.
 - BESS failure rate decreasing
 - Thermal Runaway
 - External failures: wildfires, etc.,
 - Internal failures: crush, penetration, overcharge, internal or external short circuit, electrolyte leakage.
 - Even 1 in 10 billion rate would assume happening at several facilities since millions of cells per facility.
 - Decomposition from increased heat creates exothermal reaction: raises heat more.
 - Steps taken:
 - Hazard Mitigation Analysis (HMA): documented steps to detect, identify, and address.
 - Battery Management Systems: constant monitoring and alarms
 - Emergency shutdown
 - Flammable Gas Detection
 - Fire detection and Alarm
 - Direct injection fire suppressant for battery systems
 - Exhaust ventilation for flammable gasses.
 - Deflagration venting
 - First Responder Training
 - Emergency response plans coordinate with first responders.
 - Battery Safety Requirements
 - NFPA 855
 - UL 9540 (whole system), UL 1642 (cell), UL 1973 (module / string)
 - BMS

- Thermal runaway hazard mitigation (NFPA 68 handling deflagration & 69 response deflagration)
 - Preventive maintenance / installation standards.
- Early and frequent coordination with local first responders: begins before construction, built into site plans.
- Chris Pilzer: how getting batteries to BESS locations? How transported / collected?
 - Transported by truck and ship: will come directly from manufacturer or through distribution / storage facility. Not uncommon to have delays in construction requiring storage at properly rated warehouse.
- Units are scalable on size?
 - Often use 40 foot enclosure, also 20 ft standardized. Older systems were stored in single building scaled to fit all, now using many enclosures on site, add more as needed?
- Permit needed to set up?
 - Number of different permits; siting, construction, fire,
- Process when encounter jurisdiction without an updated code?
 - Engage as early as possible. Encounter lack of familiarity, will try to educate on common leading practices. Will point to resources / codes in place in other jurisdictions, get to adopt standard practices.
- Direct injection fire suppressant?
 - Mike will send images after.
 - Early on, hazard wasn't understood.
 - 10 years ago started using clean agents (novac) or aerosoled in sprinkler format: 1 or 2 per enclosure, general dispersal, not effective.
 - Water started being used: commonly available, effective at heat, but can create shorts and exasperate.
 - Now: clean agent, non-conductive, evaporates over days, doesn't leak into ground water. Delivery system through series of tubes next to battery modules. Openings covered with plastic that will melt at set temp, when cleaning agent released will flow into location.
 - Industry standard, or AES system?
 - Mike: not only one that uses systems, but not seeing as universal concept.
 - Are seeing changes in cell products that reduces heat and gas release when cell fails; thermally insulating foam between cells / clusters: reduces danger of runaway, allows to decommission piece before runaway.
 - Could lead to phase out of direct injection.
- Suggestions / Recommended practices on early detection? Smoke, off-gas, thermal?
 - Seen mixed results from some systems. Deploy standard fire suppressant release panels (symplex), smoke and CO detectors, thermal detectors inside module first step, smoke and CO second: CO large constituent of off-gassing; separate flammable gas detectors focused on hydrogen and methane. Haven't found success / need for heat detectors outside of modules; other systems hit first.
- On suppression, recommended practice for control / mitigation when thermal runaway occurs?
 - Testing scenarios for large scale fire where suppression fails: spacing to prevent propagation between modules, coordination with first responders. Guidance is let it burn: modeled to prevent propagation. Can apply water to surrounding to keep them cool; systems meant to operate under deluge systems.
- Any recommended practices for direct injection inspection and maintenance?

- Meant to operate under pressure; sensors operate valves to release from cylinders. Cylinders require inspection: annual inspection and constant pressure monitoring. Pipes and tubes inspected when installed, designed to boiler standards. Enclosures inspected at least annually.
- Automatic alarm systems for activation: Numerous, part of BMS. Detects any agent releases / troubles. Separate logic controller inside each module that reports issues. Commonly all systems interconnected to central panel to allow quick ID through site map.
- Question re Arizona event & cleanups: took 2 months for decommissioning in that case. Where do systems stand now? Ability to bring in mobile replacement while decommissioning?
 - Hard to answer decommissioning time since few examples to draw from. AZ gave lessons learned, but does not represent today's systems: installed in single large building.
 - Would expect decommissioning would be quick. Moss Landing: several incidents: as long as people available, shouldn't take more than a few days; much time on Root Cause Analysis, don't want to remove before know what happened. May take some weeks for that.
 - Mobile replacement: common practice to have significant excess capacity to account for normal battery storage degradation. Designed for 25 year lifetime, expect 20-30% capacity loss, so often building in for that initially. Loss of single enclosure would not impact capacity of system.
 - Do have mobile energy storage systems available, can also partially decommission within enclosure depending on event.
- When decommissioning, insights / best practices?
 - Providers are equipped to transport and recycle.
- Safe discharge: with BESS system, in decommissioning do you discharge to zero or discharge to 30% for safe transport?
 - If not compromised, target 20-30%
 - If compromised, why several manufacturers have recommended let it burn. Direct injection allows to remove module, submerge / enclose. For entire enclosure, too large: dealing with ash easier than compromised battery.
- First responder key takeaways?
 - 855 outlines. Needs to be written and constantly reinforced training, but key is to stand down: systems designed around automated response, should not require manual intervention. Passive response to maintain perimeter & monitor system
- On let it burn, any study towards air emission concerns? Evacuation zones needed?
 - Standardized testing on li-ion through UL standards. From tests done by groups, know constituents are similar to typical building fires. Burn hot, plumes rise high. Most sites require plume study: regular result is that rise above effected population within site boundaries. Not exceeding hazardous levels. Moss Landing: were reports of other exposures, but models not showing impact beyond site boundaries.
 - Study by Risk Alliance that confirmed that: will send our way.

Chairman Nusbaum asked the Commission for recommendations on how to outline/structure the recommendations, and what to include in the Legislative Report. The Commission discussed the importance of the recommendations being streamlined/non-overlapping and tagged with extended producer mandated responsibility/funding as well as other possible funding sources for emergency responders, hazmat agencies,

the recycling industry, etc. The Commission recommended that the Leaders of the Subcommittees convene and meet to discuss strategies and report formatting/outlining for the Legislative Report. Progress of the Leadership meetings will be shared with the Commission at the next meeting.

The Subcommittee Leaders provided updates on the work progress of the work groups. Leaders reported that member participation in the work groups has been challenging of late due meeting scheduling conflicts, etc. The leaders will work to rally continued participation efforts from the subcommittees.

The Commission will continue to identify and invite focus groups/guest speakers to present at future Commission meetings. The Commission also discussed various upcoming/future demonstrations related to the Commission's topics of interest. More information will be provided at a later date.

The next in person Commission meeting was scheduled for Thursday, May 8, 2025 at 10:00 a.m. at MFRI in Classroom I.

Chairman Nusbaum asked the Commission to review and approve the submitted Minutes from the March 6, 2025 meeting. The Minutes as submitted were approved by the Commission with no objections raised.

Chair Emil Nusbaum asked if there was any additional business the group members wished to address, and upon hearing none, the meeting was adjourned at 12:05 p.m.

These meeting minutes are respectfully submitted by Penny L. Doty.