

Brian Scholl

**Deputy Fire Marshal
NFPA 855 Technical Committee
Member**



Disclosure

- This presentation is not intended to endorse any manufacturer or product.
- Neither FSSA nor the presenter has received any compensation from suppliers or manufacturers in this presentation.



Disclaimer

This seminar and its content is not a formal interpretation issued pursuant to NFPA or Fire Code regulations. Any opinion expressed is the opinion of the author and presenter and does not necessarily present the official position of the FSSA, NFPA and its Technical Committees nor the Phoenix Fire Department. Furthermore, this presentation is neither intended, nor should be relied upon, to provide professional consultation or services.



Disclaimer

All pictures, unless specifically noted, were pulled off the internet.

All credit of the picture goes to the person who took the picture or owns the applicable copyright



Participation

- Please ask questions
- Use the raise your hand feature or chat
- The more participation, the better



Why are we here?

McMicken Incident

- April 19, 2019
- Surprise, AZ
- Hurt 4 Firefighters
- Brought attention
- Only had clean agent system



Why are we here?

Chandler, AZ April 18,
2022

- No Injuries
- Burned for two weeks
- Used robots to open doors
- Had to shut down freeway and evacuate neighborhoods



Why are we here?

- Sprinkler systems activated
- No explosion
- Water run off issues



Why are we here?

- Micro Mobility Devices



Impact from LI Battery Fires

Negatives

- Injury and Death
- Financial Impact
- Negative Public Opinion
- Over Regulating

Positives

- More Testing
- Better Codes
- Better Awareness
- Better Prepared



Lessons Learned

- Clean agent fire protection systems alone not adequate
- No sprinkler system approved to control thermal runaway
- Need mechanical ventilation
- Need detection (smoke and gas)



Lessons Learned

- Need explosion control
- Need training
- Need to create partnerships



Code / Standards Creation

- International Code Council (ICC)
- National Fire Protection Association (NFPA)
- Underwriter's Laboratory (UL) 9540
- Underwriter's Laboratory (UL) 9540a Test



Code Creation

- ICC
- Chapter 12
- AHJ Code Amendments



Code Creation

NFPA 855 Standard for the Installation of Stationary Energy Storage Systems

- Regulate from Commissioning to Decommissioning
- Fire Protection
- Locations



Standard Creation

UL 9540 and 9540a Test

- Required for all BESS
- Robust Fire Testing
- Need to create batteries that don't propagate



Code Requirements (NFPA 855)

- Hazard Mitigation Analysis (HMA)
 - Evaluate Consequences of Failure

(1) A thermal runaway or mechanical failure condition in a single ESS unit

(2) Failure of an energy storage management system or protection system that is not covered by the product listing failure modes and effects analysis (FMEA)

(3) Failure of a required protection system including, but not limited to, ventilation (HVAC), exhaust ventilation, smoke detection, fire detection, fire suppression, or gas detection



Code Requirements (NFPA 855)

- HMA Approval

(1) Fires will be contained within unoccupied ESS rooms for the minimum duration of the fire resistance rating.

(2) Fires and products of combustion will not prevent occupants from evacuating to a safe location.

(3) Deflagration hazards will be addressed by an explosion control or other system.



Code Requirements

- Locations
 - Shall not be installed below grade
 - Shall not be located in an electrical room
 - Shall not be installed on roofs unless approved by AHJ



Code Requirements

- Smoke and fire detection
- Annunciation panels
- Fire protection systems



Code Requirements

- Fire Sprinklers
 - Density based on fire and explosion testing
 - 0.6 gpm/ft.² (Phoenix Only)
 - Alternate automatic fire control and suppression system



Code Requirements

- Mechanical ventilation
- Explosion control
- Adequate water supply



Interpreting the Code

- Is the BESS inside a building or cabinet?
- What are the results of the HMA?
- What is the location?
 - Populated Area
 - Middle of nowhere



Interpreting the Code



- Local history of fires
- Capabilities of local fire department
- Code knowledge

Interpreting the Code

- Contact AHJ as soon as possible
- Understand their processes
 - Plans review
 - Appeals
- Create open dialogue
- 3rd Party Technical Assistance



Interpreting the Code

- Best way to interpret the code, create partnerships with the AHJ



Creating a Partnership

- Meetings as soon as possible
 - Regularly scheduled meetings
 - Preconstruction meetings
- Get their name, cell phone number, email, office location, work hours
- Answer phones calls and emails



Creating a Partnership

- Timeline – What is your start date and work backwards
- Plans review can take months
- Open Communication is key
- We all want the same thing – project completion.



Creating a Partnership

- Avoid simple errors.
- Understand the codes and standards that are locally adopted
- What edition do they adopt?
- Everyone makes mistakes – own it and move on.



Code Consistency

- How do we achieve code consistency?
- Training
 - Industry
 - Fire Service
 - AHJs
 - FSSA or similar organizations



Code Consistency

- How do we achieve code consistency?
- Participate in the creation of the Standards
 - NFPA 855 Technical Committee



Code Consistency

- How do we achieve code consistency?
- Participate in the creation of the codes.
 - ICC



Code Consistency

- Be open and transparent on lessons learned
- NDA – Are they really helpful and necessary



**A TOUCHY
SUBJECT**

What's Next

- LFP
 - Lithium iron phosphate battery
- Hydrogen Fuel Cells
- New fire fighting mediums and tools
- New fire and life safety systems



What's Next

- Changing lead acid battery systems to LI.
- Battery generators instead of diesel.
- Battery fire pumps



What's Next

- Parking Garages with Electric Vehicles (EV)
 - Can they support the weight of an EV?
 - Is the sprinkler system adequate?
 - Charging stations in parking garages
 - What happens when they are on the fire?



What's Next

- What do you know that we don't know yet?
- Let's start the conversation on all new technologies
- Its all about open conservations and creating partnerships



Questions?



Thank You

Brian Scholl

brian.scholl@phoenix.gov

602-319-2297

LinkedIn

