2022 Energy Storage
Fire Detection and Vehicle Impact Protection
Presenters

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Permitting Committee Chair - CALSSA
SEAC Fire Detection Group Chair

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Topics

- Residential ESS Sizing and Siting
- ESS fire detection requirements
  - Code Requirements
  - Strategies and Options
- Vehicle impact protection
  - Back Wall, Side Wall, Return Wall
  - Bollards & Curb Stops
  - Cutting/drilling concrete
Residential ESS Siting

- ESS cannot be in living areas
- Permissible installation locations
  1. Utility room inside dwelling area
     - Cannot enter directly into sleeping area
     - Per Bob D. If you use “fire protection” glazing on a fixed (non-opening) window, you may be able to position the ESS closer than 3 feet as “alternate means” of compliance
  2. Interior walls/floors of attached or detached garages or accessory structures
  3. Exterior wall w/ min. 3 feet from doors or windows directly entering the dwelling area
  4. Ground mounts
Residential ESS Sizing

IRC ESS size limits

- 40 kWh limit for ESS inside the dwelling area in utility room
- 80 kWh limit when installing inside attached or detached garages or accessory structures
- 80 kWh limit on exterior wall
- 80 kWh limit for ground mounted ESS

\[
40 \text{kWh} + 80 \text{kWh} + 80 \text{kWh} + 80 \text{kWh} = 280 \text{kWh}
\]

Is the cumulative limit 280 kWh?

The California State Fire Marshal says YES!!
NOTE: Unit spacing shown below may be closer than 36” if allowed in the manufacturer’s UL 9540A testing and installation manual.
R328.7 Fire detection

- Interconnected smoke alarms shall be installed throughout the dwelling in accordance with Section R314, including in the room or area within the dwelling or attached garage in which the ESS are installed.

- A heat detector listed and interconnected to the smoke alarms shall be installed in the room or area within the dwelling or attached garage in which the ESS is installed where smoke alarms cannot be installed based on their listing.

### Heat/Smoke Alarm vs Detector

- **Smoke**
  - Triggered by smoke

- **Heat**
  - Triggered by heat
  - 135°

#### Smoke/Heat “alarm”
- Has built-in battery backup AND annunciator

#### Smoke/Heat “detector”
- No built-in battery backup or annunciator
Options for ESS in Garage

- Garages require installation of an interconnected heat alarm.
  - NOTE: the 2024 IRC/IFC changed the reference to a pointer to the interconnected language
  - Code references R314 for interconnection for heat/fire alarms, but this section may be confusing.
    - Possible explanation of intent of code in “code and commentary”?

- Unfortunately, there are no heat alarms listed yet to operate in unconditioned spaces.
  - The UL 539 standard added this option in recent 2022 update.

- What can you do today?
  1. Avoid garage installs
  2. AHJs might permit ESS in garages at this point until listed device available using an “alternate approach”
  3. Possibly use one of the heat alarm/detectors on following page if allowed by AHJ
  4. Kevin Reinertson - Possible new option for new homes, use sprinkler system in garage with flow alarm which
     triggers and activates smoke alarms/detectors??
     - [https://osfm.fire.ca.gov/media/kklgizii/ib_ess_heat_detector_residential_code_final.pdf](https://osfm.fire.ca.gov/media/kklgizii/ib_ess_heat_detector_residential_code_final.pdf)

- Would Conditioning the garage (add Heat & AC and comply with energy code) and use of a listed
  heat alarm or heat detector be an option? NOTE - This may not be viable based on current Code.
Option options tasks?

- NFPA 855 proposals due June 1
  - Heat alarms/detectors
  - sizing and siting
  - Using EV’s as Home Power backup use? - temporary use only language may need clarification
- Should SEAC working group generate proposal for NFPA 855 to address interconnected smoke/heat, alarms/detectors - Mark Rodriguez is volunteered by Jeff Spies to fix this. Kevin R seconds
  - Bob D. and Kevin R. to participate
- Vince has new wireless option under test
  - Omnishield (previously called “Crossfire”)
First Alert/BRK HD6135

First Alert BRK Brands Hardwired 120-Volt AC/DC Heat Alarm with Battery Backup - HD6135FB

May not work in Riverside, Bakersfield, Phoenix, or other hot climates where max ambient exceeds 115°F

135° trigger temp - 115° max ambient temp
System Sensor Heat Detector 5600 series with Fire Alarm Control Panel

- Has battery backup

System Sensor Heat Detector 5600 series

- 194° trigger temp 174° ambient temp.
- System Sensor P2RHK-120 Horn/Strobe
- No battery backup
Resideo wireless heat and smoke alarms

- **Detector/alarm**
  - Has onboard annunciation!

- **Wirelessly connects** w/ smoke alarms inside house

- **Heat alarm costs** ~$60, plus you will need to purchase control panel
Vehicle Impact Protection

- IFC Figure 1207.11.7.1 ESS Vehicle Impact Protection
  - Requires bollards or curb stops for ESS that are “subject to vehicular impact damage”
  - ESS in areas labeled “Not subject to damage” would not require bollards or curb stops.
Vehicle Impact Protection (VIP)

- Note terminology and minimum distances in diagram
- “Side Wall” without “return wall” requires bollards
Vehicle Impact Protection (VIP)

- VIP required for installation on:
  - “Back Wall”
  - “Side Wall” without “Return Wall”

- “Side Wall” with “Return Wall” may not require VIP

- AHJ may also require raising 36” off floor
### Bollard or Curb Stop?

- **Bollard**
  - Requires cutting/drilling into slab
  - Difficult/expensive to cut into slab
- **Curb Stop**
  - Some AHJs wont allow curb stops
  - May require drilling into slab
- **AHJ may also require raising ESS 36” off floor**
Cutting/Drilling Post Tensioned Concrete

- Cutting/drilling into post tensioned concrete slab for bollard or curbstone requires x-ray mapping of cables.
- WARNING: Improper cutting or drilling can result in injury or death!
How to Learn More

● CALSSA Codes, Standards & Permitting Committee
  ○ Email ben@calssa.org to join monthly meetings

● NABCEP Conference https://tinyurl.com/mrye25bz
  ○ Ryan Mayfield: NEC workshop training
  ○ Jeff Spies: Moderating panel on PCS/EMS/Load controls

● SEAC Meetings & Resources https://sustainableenergyaction.org/

● IREC Inspector Training https://irecusa.org/clean-energy-training/

● IAEI Section meetings https://www.iaei.org/page/section-meetings
Question Time

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Thank you for your participation