**ENERGY STORAGE SYSTEMS**
**ELECTRICAL SAFETY FOR FIRST RESPONDERS**
**UNDERSTAND THE UNIQUE RISKS WHEN ENERGY STORAGE SYSTEMS ARE INVOLVED**

### WHERE ARE ENERGY STORAGE SYSTEMS LOCATED?
- Residential settings, usually near electrical panel
- Microgrids
- Commercial
- Critical infrastructure
- Utilities

### MITIGATION AND EMERGENCY RESPONSE
- **Is the system active or shut down?**
- **Are there abnormal temperature readings? Is there smoke or toxic or flammable gas present?**
- **Has the fire suppression system been activated?**
- **Qualified personnel** should be contacted to find system status and response procedures

### IDENTIFY THE HAZARD
- **Location and type of battery system**
- Reference any pre-planning documents
- Reference any safety data sheets

### SHUTDOWN
- Communicate shutdown to **all personnel**. Level of shutdown may depend on level of incident
- Secure all non-essential power. May require qualified person to assist
- Shut down **small breakers** before main breaker
- Shut off **main battery disconnect**; energy storage systems may still provide power
- Do not enter utility substations, battery installations, or other facilities. Do not attempt to operate equipment without **qualified utility personnel**
- Continue to **monitor** energy storage systems to avoid future fires. **May take hours or days**
- **Monitor air and provide proper ventilation**
- Avoid any liquid. Beware of **trapped gas** and explosion hazards. Do not approach or attempt entry of a battery room suspected of **thermal runaway** and **off-gassing** if life is not at risk

### INCIDENT

#### Electrolyte Spills
- **Identify chemistry involved** to know the response
- **PPE and SCBA offer limited protection**
- **Dike area** around spread – clean up needs to be completed by **qualified personnel**
- **Interview knowledgeable staff**

#### Overheated Batteries
- Overheating can be evident by **bulging or other deformities**
- If you can see the battery, **monitor them with a thermal imager** for changes to temperature
- **Air monitoring and ventilation** should be ongoing
- **When batteries are shut off, they should cool**, but it may take time. **If temperatures do not go down or go up, there may be a fire**
- **Ensure full PPE and SCBA are being used in firefighting operations**
- **Review safety data sheets or pre-plans** to know battery chemistry and hazards
- **Secure water supply**

#### Energy Storage System Fires
- **Evacuate area** affected by fire
- After fire, **monitor for flammable or toxic gases**. Always **monitor for pockets of stranded gas**. Never attempt to overhaul a damaged ESS
- **Consider turning off HVAC** but keep dedicated exhaust for energy storage systems
- **Attempt to extinguish the fires** (Not for NaS battery-type fires). **Apply water directly to cells** if possible to remove heat. If direct water application isn’t possible, **apply water to protect exposures**
- **Continue temperature monitoring**. May take hours or days to cool. Continued explosive and toxic off-gassing, and re-ignition, is possible

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