



Electric Vehicle Fires

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Disclosure

- I am not a subject matter expert with regard to EV Vehicles or EV Vehicle Emergencies.
- I am a Professional Firefighter from Montana with 19 years of experience. I have witnessed many different response capabilities spread across the state.
- We are not endorsing any specialized equipment shown in this presentation. It is only being shown for informational purposes.
- EV fires represent a small portion of an emerging challenge to the fire service brought by fires started by Li batteries.

How Fire
Depts
assess
incident
risk

Low Risk, Low Frequency

Low Risk, High Frequency

High Risk, High Frequency

High Risk, Low Frequency

Science of Fire Fighting



Hazards Associated With EV Fires

- All Classes of Fire are represented (A, B, C, D)
- Lack of clear Guidance and Best Practices for Suppression
- Lack of Standardization with EV's
 - Per the US Fire Administration As of June 2023 8 Manufacturers are compliant and another 12 are working towards NFPA Compliance.
- Potential for reignition due to stored energy and thermal runaway
- Potential Contamination of Soil from suppression efforts
- Damage to infrastructure (roadway surface exposures to heat)

Tactics in use today

- Copious amounts of water
 - Thousands of gallons of water VS hundreds used during an ICE vehicle fire
 - Labor and Resource intensive
 - Accessing the portion of the battery in thermal runaway can be challenging
- Use of Specialized Equipment
- Submerging the Vehicle in Water
- Controlled Burn Down
 - Requires Firefighters to remain on scene to protect exposures
- Getting Creative

Specialized Equipment

- Vehicle fire Blankets
 - Suppress the fire and lower temperatures. Water is still needed for extinguishment.
 - Use on initial incident does not prevent reignition later.
 - Cost \$1,550 single use. \$2,600 for a multi use blanket.



Rosenbauer BEST

- Battery Extinguishing System Technology
 - Pneumatic piercing Nozzle
 - Claims to Use less water than conventional means
 - There is still a possibility of reignition due to thermal runaway
 - Cost Approx.. \$30,000





Phoenix Fire Dept EV Incident

- May 2nd 2023 Waymo Electric Vehicle caught fire at a warehouse.
- After previous experience trying to suppress a Tesla fire that involved shutting down 8 lanes of traffic for 9hrs.
- Responders switched tactics. After cooling the vehicle they placed it in a roll-off container and covered it with wet sand.
- Vehicle was uncovered a week later and was no longer a hazard.

Sacramento Tesla Incident

- Sacramento Metro Fire Fighters responded to a wrecking yard for a Tesla involved in a MVC 3 weeks ago.
- Upon arrival Firefighters began suppression efforts due to reignition. Crews could not extinguish the fire with 4,500 gallons of water.
- Command eventually requested the facility dig a pit so a loader could push the EV into.
- Vehicle was then submerged in water and finally extinguished.

Solutions

- Continued cooperation and information sharing between NGOs, Government organizations, and the Fire Service.
- Funding for training and specialized equipment to deal with these incidents.
- Streamline access to information such as Electric Vehicle ERGs. Making these resources more accessible to responders in the field.

References

- US Fire Administration ERG Page
 - [USFA ERG Link](#)
- US Fire Administration EV Fire bulletin
 - [EV fire bulletin Link](#)
- NTSB Safety Report For First Responders
 - [NTSB Safety Report Link](#)

Videos

- CBS News Lithium ion battery Fires are up are Fire Fighters Ready?
 - [CBS News link 2023](#)
- Lebanon Fire Department receives special fire extinguisher for electric vehicles
 - [FOX 43 Video Link](#)
- Mountain View Fire Department gets new tool to battle electric vehicle fires
 - [KTVU FOX 2 San Francisco link](#)

Videos Cont.

- Firefighters call for new ways to put out electric vehicle fires
 - [Fox 40 News link](#)
- Phoenix tried new method to put out Waymo EV fire
 - [FOX 10 News link](#)