U.S. Department
of Transportation
**National Highway
Traffic Safety
Administration**

1200 New Jersey Avenue SE.
Washington, DC 20590

October 14, 2022

Mr. Jimmy Patronis
Chief Financial Officer
Florida Department of Financial Services
200 East Gaines Street
Tallahassee, FL 32399

Dear Mr. Patronis:

Thank you for reaching out to the National Highway Traffic Safety Administration (NHTSA) on electric vehicle (EV) exposures to saltwater after Hurricane Ian. We are tracking Florida EV fires through news reports, fire department social media sites, and other sources, and we can confirm your experience in North Collier with reignition is not an isolated event.

NHTSA has a long history of working with other Federal partners, automobile manufacturers, standards development organizations, first responders, vehicle owners, and others to ensure the safety of EV owners and those who interact with these vehicles.

In 2012, NHTSA collaborated with the U.S. Department of Energy (DOE), the United States Fire Administration, the National Fire Protection Association (NFPA), and others to publish the 2012 *Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped with High Voltage Batteries*.

The first instances of EV fires caused by saltwater flooding occurred in October 2012 after Hurricane Sandy flooded the port of Newark, New Jersey. Among the submerged vehicles were 338 Fisker battery-electric vehicles. NHTSA worked closely with Fisker staff to understand the battery response to submersion and share the investigation results. This resulted in the 2014 revision of the *Interim Guidance for Electric and Hybrid-Electric Vehicles Equipped with High Voltage Batteries*[i]. NHTSA has subsequently published two reports on the immersion of electric vehicles and batteries in salt water[ii,iii] that provide additional technical information.

NHTSA and DOE also funded the NFPA to develop and promote first responder EV training. The NFPA training website, which includes EV emergency response guides, is: https://www.NFPA.org/EV.

You also asked some specific questions of NHTSA, and our responses are below:

1. Has NHTSA directed EV companies to immediately communicate with consumers on dangers related to a vehicle impacted by storm surge? Can the Agency make that information available to my office so that we can distribute?

   The recent incidents in Florida that NHTSA is aware of involved Tesla vehicles. The Tesla emergency response guide includes a section on handling submerged vehicles[iv] in addition to their recommended practices for responding to battery fires. Tesla also developed YouTube demonstration videos to accompany their recommendations[v].

2. Do the personal protective equipment (PPE), including the gas masks utilized by fire rescue teams, effectively protect first responders from poisonous gases?

   Yes, first responders wearing appropriate PPE and self-contained breathing apparatus are protected adequately from toxic gases emitted from EV batteries-involved fires. There have been a number of studies collecting and evaluating smoke from burning a range of lithium-ion battery types[vi,vii].

3. Do search teams need to create specific missions for immediate removal of EVs by secondary responders?

   It may be helpful for persons who are not involved in immediate lifesaving missions to identify flooded vehicles with lithium-ion batteries and move them at least 50 feet from any structures, vehicles, or combustibles. Always assume the battery and associated components are energized and fully charged.

4. Is there research or guidance as to the timeline by which corrosion may lead to fires?

   Lithium-ion vehicle battery fires have been observed both rapidly igniting and igniting <u>several weeks</u> after battery damage occurred. The timing of the fire initiation is specific to the battery design, chemistry, and damage to the battery pack. Test results specific to saltwater submersion show that salt bridges can form within the battery pack and provide a path for short circuit and self-heating. This can lead to fire ignition. As with other forms of battery degradation, the time period for this transition from self-heating to fire ignition can vary greatly.

5. Is there any guidance, or specific designated locations, where compromised EVs should be taken to burn-out? Have Federal authorities been sharing that information with secondary responders, like tow truck operators?

   In 2014, NHTSA published updated interim guidance for towing and recovery operations of EVs[viii]. The guidance says, "Do not store a severely damaged vehicle with a lithium-ion battery inside a structure or within 50 feet of any structure, vehicle, or combustibles." NHTSA, other Federal partners, and the NFPA have been sharing this information as broadly as possible.

I hope this information is helpful. If you have any further questions, please feel free to contact me or Dave Bryson at our Office of Emergency Medical Services at (703) 989-2071 or Dave.Bryson@dot.gov

Sincerely,

Jack Danielson
Executive Director

cc: The Honorable Frank Pallone, Jr.
Chairman, Committee on Energy and Commerce

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[i] https://www.nhtsa.gov/sites/nhtsa.gov/files/811575-interimguidehev-hv-batt_lawenforce-ems-firedept-v2.pdf
[ii] https://rosap.ntl.bts.gov/view/dot/40791
[iii] https://rosap.ntl.bts.gov/view/dot/57013
[iv] https://www.nfpa.org/-/media/Files/Training/AFV/Emergency-Response-Guides/Tesla/Model_3_Emergency_Response_Guide_en.ashx
[vv] https://www.youtube.com/watch?v=ntK3rvVl2Qw
[vi] https://www.ri.se/sites/default/files/2020-12/FIVE-2020%20Emergency%20responses%20in%20smoke%20from%20Li-ion%20batteries%20V1.1%20def%20-%20Emergency%20responses%20in%20smoke%20from%20Li-ion%20batteries.pdf
[vii] https://www.ri.se/sites/default/files/2020-12/Klueh2020_Fire_Safety_of_Lithium-Ion_Traction_Batteries_1.pdf
[viii] 811576-interimguidehev-hv-batt_towing-recovery-storage-v2.pdf (nhtsa.gov)