

SG-EDR-39

EDR Data Survivability EV Post-Crash Fire Accident Cases in S. Korea

Korea **A**utomobile **T**esting & **R**esearch **I**nstitute(**KATRI**)

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Introduce

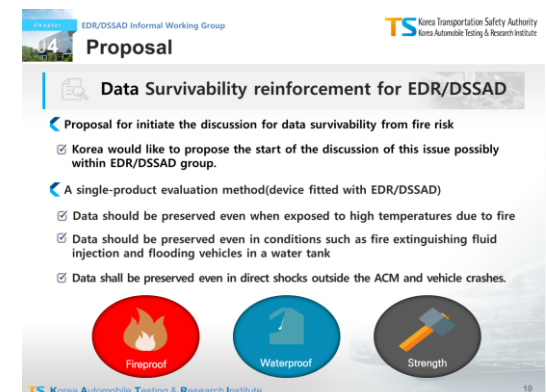
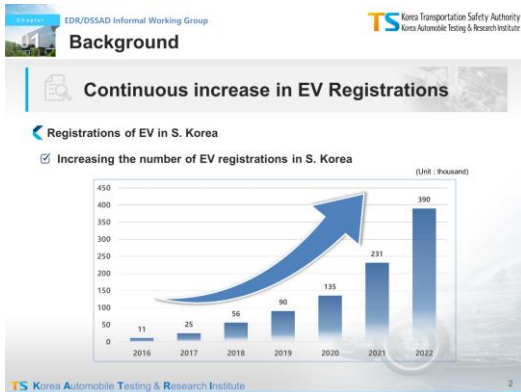


S. Korea proposed discussions to ensure data survivability from EV fires(23 March 2023)

* SG-DSSAD-14-03 : EDR-DSSAD reinforcement necessity of Data Survivability(KATRI)

Last Discussion Point

- ✓ (Overview) Based on the increasing number of EV registrations and EV fires, there is a need to discuss data survivability in case of EV fires.



Today's Main Discussion

- ✓ Introduction of EV post-crash fire cases & analysis of EDR data survivability in S. Korea.
- ✓ Identify EDR data survivability considerations

EV Post-Crash Fire Accident Cases in S. Korea

Accident Cases : Ensuring data survivability

- ✓ **(Summary)** Fire after crashing into bumper near highway toll booth
- ✓ **(Damage)** Confirmed front center and the engine compartment of the accident vehicle
- ✓ **(Data Survivability)** EDR data was retrieved.
 - ❖ Undercarriage flooding occurs during extinguishing of accident vehicle
 - ❖ EDR data records indicate that the speed at the Time 0 was 96kph



- ✓ **(Summary)** Fire after crashing into retaining wall on the side of the road
- ✓ **(Damage)** Deformation confirmed at the front of the vehicle up to the front of the high-voltage battery pack
- ✓ **(Data Survivability)** EDR data was retrieved.
 - ❖ Undercarriage flooding occurs during extinguishing of accident vehicle
 - ❖ EDR data records indicate that the speed at the Time 0 was 109kph



EV Post-Crash Fire Accident Cases in S. Korea

Accident Cases : **NOT Ensuring data survivability**

- ✓ **(Summary)** Fire after frontal collision with concrete barrier
- ✓ **(Damage)** Deformation confirmed at the front of the vehicle up to the front of the high-voltage battery pack
- ✓ **(Data Survivability)** Unable to retrieve EDR data
 - ❖ ACU corrupted by thermal runaway



- ✓ **(Summary)** Fire after entering an underground car park and crashed into a wall
- ✓ **(Damage)** The vehicle burned, and the driver escaped, but one passenger died inside the cabin
- ✓ **(Data Survivability)** Unable to retrieve EDR data
 - ❖ Both direct connection and EEPROM swapping failed
 - ❖ Car log data(speed, motor RPM, etc.) available via OTA



Conclusion & Proposal

Status of KATRI's Electric Vehicle Post-Crash Fire Investigation

No.	Date	Manufacturer	Model	EDR Data Survivability	Reason for unretrievable
1	2020-12-09	A	AA	X(OTA)	Vehicle Burnout
2	2022-06-04	B	BB	O	
3	2022-06-25	B	BB	O	
4	2022-09-07	C	CC	X	Vehicle Burnout
5	2022-12-05	B	BB	O	
6	2023-01-09	A	AA	X(OTA)	Vehicle Burnout
7	2023-03-15	B	BB	O	
8	2023-07-04	C	CC	O	
9	2023-11-13	B	BB	O	

- ☑ KATRI investigated 9 cases of post-crash fires in EVs and found that EDR data survived in 6 cases.
- ☑ In the 3 unretrievable cases, the ACU was damaged as a result of the vehicle being fully burned
- ✓ In the case no.1 & no.6 the pre-incident data was available from the car-log data.

Considerations

- ☑ If the vehicle is not severely burnt out, high speed impacts and extinguishing water have not been found to corrupt EDR data.
 - ✓ The current level of manufacturers' self-testing is sufficient to ensure data survivability in the case of floods and high speed impacts.
- ☑ However, data survivability is not assured due to ACU corruption in thermal runaway.
- ☑ Pre-crash data is available when OTA is used to transfer car-log data from the vehicle.
 - ✓ S. Korea thinks of an approach on how to transmit the EDR data to OTA for airbag deployment accident.

THANK YOU

