

**Submission
No 14**

ELECTRIC AND HYBRID VEHICLE BATTERIES

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Allianz submission on the NSW Legislative Council's Joint Standing Committee on Road Safety – Inquiry into Electric and Hybrid Vehicle Batteries

Allianz Australia (Allianz) welcomes the opportunity to provide a submission to the NSW Legislative Council's Joint Standing Committee on Road Safety – Inquiry into Electric and Hybrid Vehicle Batteries. Allianz provides general insurance cover to 3.5 million customers Australia-wide, including home, motor, small business, workers compensation and travel insurance. Allianz has undertaken a review of claims caused by lithium-ion batteries since 2020 and identified a significant increase in both the number of claims occurring each year and the cost of those claims.

Between 2020 and the first 8 months of 2023, there has been a 440% increase in the number of claims arising from fires caused by lithium-ion batteries. The cost of these claims has exploded by 900% due, in particular, to an increase in the number of high value commercial property claims that have occurred in 2023 compared to 2020. Allianz is concerned that these numbers continue to rise in light of the increasing number and variety of products containing lithium-ion batteries. Allianz would like to emphasise that these claims have arisen from battery fires associated with products like eBikes, eScooters and other lithium-ion battery powered household products. However, we offer this information because many of the lessons learnt from such products can be applied to electric vehicles.

This submission contains information provided by EV FireSafe who Allianz is working with to better understand the safety of electric vehicles (EVs). EV FireSafe was funded by the Australian Department of Defence in 2021 to research passenger electric vehicle battery fires and emergency response, particularly where the EV was connected to a charger at the time of the incident. The core of their work is a database of every passenger EV battery fire, globally since 2010.

Further information responding to the terms of reference is below:

- (a) the risk and management of fires and other issues caused by batteries in electric and hybrid vehicles, including light electric vehicles.

Research shows that Lithium-ion (Li-ion) batteries are most dangerous following high speed, high damage collisions, when exposed to extreme mechanical abuse, submersion in water, particularly salt water, and especially following the EV being impacted by storm surge or debris hitting the underside of the vehicle. There are also risks associated with repurposed or modified Li-ion batteries, such as in DIY converted EVs or retrofitted LEVs, such as e-bikes, and when being charged unsupervised, and when the State of Charge is greater than 50%.

EV FireSafe's data indicates approximately 16% of EV Li-ion battery fires have occurred while the vehicle is connected to a charger. A number of those were EVs being charged following a previous collision or submersion event, thereby increasing risk even further.

Allianz manually captures data in relation to Li-ion battery fires where the fire is investigated by authorities when they have been identified as suspicious or there is a high probability of

financial recovery against a third party. A review of the data we have available involving Li-ion batteries indicates that property insurance claims resulting from Li-ion battery fires are predominantly caused during the charging of power tools and vacuum cleaners. The average claim cost in these instances was \$160,000. Allianz does have an example of one claim which resulted in a warehouse fire caused by a thermal runaway event from a cordless drill. This fire caused \$3.8M worth of damage to the property.

Further information on passenger EV battery fires can be found at <https://www.evfiresafe.com/ev-battery-fire-overview>

- (b) the risk to workers in the automotive industry and emergency services personnel caused by batteries in electric and hybrid vehicles and the adequacy of training and equipment for workers in the automotive industry and emergency services personnel regarding potential hazards of batteries in electric and hybrid vehicles

Workers and emergency services personnel face significant risks when working with Li-ion batteries and there are common knowledge gaps that can be rapidly addressed to enhance responder safety around EVs in collisions, road rescue, submersion, fire and battery fire events. There is also risks associated with the smash repair and auto-mechanical sectors because there is no national qualification to work on high-voltage vehicles.

Properly funded research, testing, awareness and training for workers in the automotive industry and emergency service agencies will mitigate risks to both responders and the public. These activities would complement emerging testing programs and dramatically enhance agency understanding and awareness of rapidly emerging electrified transport, reducing the fear, uncertainty and doubt commonly expressed in EV Firesafe's discussion with first responders.

The following data and awareness activities would benefit from national coordination and funding:

1. EV emergency response guides (ERG) written to ISO 17840

ISO 17840 ensures standardised ERGs are available for responders attending incidents involving EVs, enabling a faster response. The use of this ISO is currently optional for EV manufacturers.

Recommendation

Mandatory ERG to ISO 17840 for all EVs sold into the Australian market, including passenger cars, battery electric buses, electric trucks, light electric vehicles, electric plant, agricultural, earthmoving and other industrial and commercial electrified vehicles.

2. State road authority registration look up to include fuel source

Emergency responders may use their state road authority website to look up registration details of vehicles involved in road traffic incidents to get details regarding make, model, year of manufacture etc.

These registration checks do not currently list fuel source (Electric, Hybrid, LPG, CNG, Hydrogen etc), however, doing so would dramatically improve responder safety at road traffic incidents involving alternatively fuelled vehicles.

Additionally, in the event of natural disasters, vehicles registered as alternatively fuelled in affected areas could be identified to share emergency response information regarding towing and removal.

Recommendation

Apply fuel source information to each state road authority registration check websites or apps.

3. EV walkaround and 360 degree videos

EV battery fires are very rare, however, EVs involved in road collisions are becoming common. Responders face new risks and challenges in identifying, immobilising and isolating an EV to ensure their safety when managing an incident or conducting road rescue.

Recommendation

Fund the professional filming of a library of publicly available and promoted EV 'walkarounds', showing a selection of the most common passenger, commercial and heavy EVs. These can be created in collaboration with EV manufacturers.

4. EV road rescue demonstrations

No agency has yet developed EV road rescue guidance, however, EV Extrication Considerations have been developed by EV FireSafe in collaboration with the Victorian State Emergency Service and individual experts.

Recommendation

The NSW government fund the supply of a written-off EV to relevant state agencies for road rescue demonstrations, awareness and videoing for online training.

5. EV Emergency Response Guide National Database

There is no standardisation of EV incident management advice from manufacturers, particularly regarding high voltage isolation methods, fire suppression or post-incident removal.

Recommendation:

- Create a database of passenger, light and commercial electric vehicle Emergency Response Guides (ERGs) and Rescue Cards (RCs) to identify high voltage isolation similarities and provide details to ANCAP for cross-checking against the ANCAP Rescue app.
- Identify manufacturers not creating ERGs to ISO 17840 and work with them to standardise across EV sectors.
- Reduce the need for agencies to find funding for private ERG platforms, which can be cost prohibitive.
- Include Safety Data Sheets and specification sheets for all EV charging unit models available in Australia.

6. EV Registration National Heat Maps

Searchable EV location data and high-uptake heatmaps will assist emergency agencies better plan training rollout and pre-empt potential EV battery fire risk.

Recommendation

- The NSW provide 5 years of searchable EV registration data for the purpose of creating locational heat maps for agencies, fire brigades, stations, branches and units to understand EV numbers in their area for training and awareness purposes;
- Provide state agencies EV locational hotspot data during natural disasters, such as flood and bushfire.

7. EV and battery charging online learning sessions for workers in the automotive industry and emergency agencies

A disconnect exists between the EV, charging sector, repair sector and the emergency response communities, however have expressed to EV FireSafe a desire to share information.

Recommendation

In collaboration with the EV sector, the relevant NSW government agencies should coordinate a series of monthly webinars to help stakeholders to better understand:

- EV Li-ion battery 101 basics;
- EV road rescue considerations;
- EV HV systems;
- EV charging basics; and
- Bi-directional charging and emerging technology.

8. EV training props

EV battery packs are hidden within the vehicle, making it difficult for responders to understand high voltage systems.

Recommendation

The NSW government source new EVs to create delaminated and fully functioning EV training props showing HV systems, components, cables and battery casings for relevant training purposes and educational resources.

9. Raise public awareness of when an EV poses a higher risk

EV FireSafe’s research indicates that 6 Australian EV battery fire incidents in enclosed spaces were caused by the EV battery being impacted in a recent collision. A further 53 incidents (not in enclosed spaces) are linked to collision or road debris. For example, one incident describes a tow ball falling off a truck and hitting the underside of an EV, leading to battery fire.

Recommendation

The NSW government should develop public awareness campaigns and information sources for EV owners that they should not enter an enclosed space if they’ve been involved in a collision or submersion.

While it might be impractical to require every public carpark to carry such signage, the inclusion of this information in ‘What to do in a crash’ information cards or webpages released by various relevant state authorities should be updated and consideration given to inclusion in drivers licensing tests.

10. Post incident removal, secondary responders, storage and wrecking

Awareness of EV Li-ion battery fire risks in the secondary response sector remains low and should be addressed with some urgency; EV FireSafe's database indicates four tow truck drivers have been injured while managing the removal of an EV.

Recommendation

Collaboration of the secondary response sector with emergency and government agencies to develop removal tools and procedures, such as metal-sided 'tubs' that can be filled with water, should be considered, as should protocols for the safe storage and disposal of EV Li-ion batteries.

This action has a direct benefit to emergency agencies as international transport agencies have experienced significant delays in EV removal companies providing services, tying up emergency resources to 'babysit' the vehicle while waiting for removal services to arrive.

11. Light electric vehicle use and charging

LEVs pose the greatest risk to life and property of any electric vehicle type. Electric bikes, scooters, skateboards and unicycles are injuring people on a weekly basis globally and there has been fatalities and multiple injuries here in Australia.

Recommendation

City street e-bikes and e-scooters are being taken up by local government authorities (LGAs), however, the bulk charging of these EVs and/or their removable battery packs, poses a far greater fire risk than passenger EV charging hubs. ACT Fire and Rescue has already experienced a warehouse fire due to these 'juicing'¹ sites.

Guidance for the transport, storage and charging of bulk units of e-bikes and e-scooters should be developed as a matter of urgency. Additionally, agreements between LGAs and e-mobility operators should be updated to reflect fire safety requirements.

12. Battery electric bus charging

Battery electric buses (BEBs) are considered to pose a higher risk to emergency responders than passenger EVs. There have been 21 BEB battery fire incidents globally since 2010, in a global stock of approximately 400,000 BEBs. This indicates an incident rate almost 5 times higher than passenger EVs with a greater risk to life and property safety.

Recommendation

BEB Emergency Response Guides, where available, do not always follow ISO 17840, do not always have all required information and training is not always available to emergency responders.

Training and guidance for BEB emergency response, as well as guidance for BEB charging in depots, should be developed.

The data, research, awareness and training activities outlined above will dramatically enhance emergency responder safety and confidence in the EV sector.

(c) any other related matters.

¹ The bulk charging of multiple batteries simultaneously.

Further government intervention is required to manage Li-ion battery safety risks. Allianz recommends:

For road-registered electric vehicles:

- Emergency Response Guides written to ISO 17840 should be mandated for each make and model of EV prior to market release and provided to the appropriate authorities for the use of emergency responders (eg. via the ANCAP Rescue app).

For (Light electric vehicles) LEVs for personal use:

- Regulation restricting the sale of poor quality devices is needed;
- Recall of devices with known thermal runaway problems;
- Emergency Response Guides written to ISO 17840 should be made mandatory prior to release to market and provided to the appropriate authority for the use of emergency responders.

For LEVs for public pay-to-hire use:

- Regulation on the bulk charging of devices, sometimes known as 'juicing';
- Local Governments with contracts with pay-to-use LEV companies need awareness of the fire risks and guidance on how to mitigate that risk; this should be written into agreements with such companies;

It is also critical that Standards are developed for Li-ion batteries used in Australia. From an insurance perspective, if the lack of a Standard results in a mix of battery quality in the market and no discernable way to identify those that are high risk, it could lead to insurability issues (for example, exclusions under home insurance policies for fires caused by Li-ion batteries). It is therefore recommended that Emergency Response Guides should be written in a globally standardised format and comply with ISO 17840. For the installation of EV charging infrastructure, compliance with AS/NZ 3000 Appendix P should also be required.

Another matter to consider is that consumers have little to no awareness of Li-ion battery risks. Further education of consumers is required and the key messages should include:

- be alert, not alarmed;
- buy the best quality you can afford;
- look for electrical compliance information on the Li-ion battery device and/or charging equipment (or associated manuals);
- using the correct battery management system for the device;
- charging equipment should be consistent with the manufacturers recommendations and installed to Australian Standards if hardwired;
- be aware of the signs of thermal runaway;
- use interconnected smoke alarms.

Consumers also need urgent education on the correct methods of disposing of Li-ion batteries. It is recommended that government and industry develop disposal drop off points and recycling facilities for the safe disposal of Li-ion batteries.

