



Position Statement

Electric Vehicles (EV) and EV Charging Stations in Buildings

The presence of electric vehicles (EVs) and the installation of EV charging stations within buildings present a number of risks and safety concerns for the South Australian Country Fire Service (CFS) with regards to firefighter intervention.

The CFS are seeing rapidly growing interest and uptake in the installation of EV charging facilities at commercial premises and acknowledges the role such technology plays in moving towards a more sustainable energy future. EV charging facilities present a unique risk profile within the built environment which may not be fully catered for in current prescriptive requirements of the National Construction Code (NCC) or Australian Standards. The CFS encourages careful consideration of the specific risks and appropriate safety and mitigation measures when planning to introduce such installations.

EVs are powered by alternative energy fuel cells, consisting primarily of a variety of lithium chemistry technologies.

A failure event within a lithium chemistry battery (overcharge, equipment failure or mechanical impact) has the potential to lead to a thermal runaway event within the EV battery, which may pose the following significant risks and challenges for firefighters in the management of an incident:

- Toxic smoke production
- Rapid rate of fire spread
- Heat release rate of EV fire
- Exothermic chemical reaction-fuelled fire that cannot be extinguished
- Significant fire duration (4+ hours)
- Proximity of adjacent fuel loads (other vehicles)
- Intervention and suppression resources in proximity
- Duration of available water supply
- Potential for re-ignition
- Contaminated cooling water runoff

Based on discussions with and advice from an international expert in the field, sufficient ventilation is critical during and for the management of incidents involving battery fires, coupled with ongoing water cooling.

EV Charging Stations in Buildings

When considering Development Applications, the CFS requests the certifying authority consider the following items in relation to EV charging stations against the relevant NCC Performance Requirements. Clause E1.10 and/or Clause E2.3 of the NCC may be appropriate mechanisms by which to document and address associated Performance Solutions:

- Emergency and automatic shutdown controls for EV charging stations.
- Block plans for the building to include locations of EV charging stations.



- Block plans for the building to include locations of EV distribution boards and emergency shutdown controls.
- Vehicle impact protection (e.g., bollards) for EV charging stations.
- Location of EV charging stations and their proximity to exits and other fire safety systems.

EVs in Carparks

When considering Development Applications, the CFS requests the certifying authority to consider the suitability of existing Deemed-to-Satisfy Provisions, in regard to the parking of EVs within a building and considering the risks and challenges identified above, to provide suitable levels of protection for occupants and fire brigade intervention activities, such as:

- Fire detection and early warning and intercommunication systems.
- Ventilation, smoke management and air handling systems.
- Fire hydrants and automatic fire sprinkler systems, including their locations, proximity to the risk and duration of operation.
- Fire resistance level (FRL) of bounding construction.

The CFS does not have the expertise to assess the adequacy of a design solution in terms of FRLs or the level of sprinkler protection or ventilation required for EV fires. The CFS will review design solutions in terms of CFS operational response requirements relating to expected emergency response activities and the ability to satisfactorily interact with the installed systems.

The CFS continues to seek and consider available information on EVs and EV charging stations and is in contact with international experts in the field to inform our preparedness and response to incidents involving these systems.



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