1. What built-in safety features do electric and hybrid vehicles have to protect their electrical systems and batteries from water damage during a flood?

In normal operation, it is to be expected that the exterior of the vehicle will get wet, that the vehicle will drive through shallow standing water, etc. Road registered vehicles built to Australian design rules will handle this, irrespective of powertrain. Just like a petrol or diesel vehicle, an electric vehicle that has been subject to flood damage should go to a properly equipped and competent party for inspection, rather than going immediately back into service. The degree to which electrical systems in vehicles are proof against flooding, and the impacts of depth of submersion, and fresh water vs salt water, are not matters on which I have specific expertise – I'd recommend a discussion with the vehicle OEMs on this point. I would suggest that many of the considerations related to flood-affected petrol and diesel cars will almost certainly apply to flood affected EVs – for example: https://www.mynrma.com.au/cars-and-driving/insurance-and-rego/resources/what-you-need-to-know-about-flood-hit-cars

2. What are some common issues arising from electric and hybrid vehicle conversions, and how can these be addressed?

First point: Conversions are a minute fraction of the road registered electric vehicle market. Issues in this domain will likely be limited, in part because of the very small numbers involved. Conversions of bicycles to electric are likely far larger in number, and (given the relative lack of regulation) more likely to cause problems such as fires.

I'd recommend you engage with AEVA on this question – they're a membership organisation including enthusiasts who have been converting petrol cars to road registered EVs in Australia since the 1970s.
https://www.aeva.asn.au/

Specific businesses that are doing work in this domain that you may wish to engage with are:
https://www.jauntmotors.com/ - they're in Vic, but the issues will be comparable.
https://www.januselectric.com.au/ - they're into truck conversions, based in NSW.

There is some question with regard to confidence that the people doing this type of work in an "at home, personal project" context are qualified and competent. There's a distinct difference in regulation between how we handle electrical work in the context of the home (a person without an electrical licence is not legally allowed to do it), and how we handle work on vehicles in the context of the home (anyone's allowed to maintain their own car). It ***may*** be appropriate to require that persons doing this type of work prove competency – not at a level of 'they need to hold an electrical licence', but potentially at a level of 'they've completed a relevant training module, such as AUTETH101'. Evidence will be important here – we're not aware of anyone doing one of these conversions being injured in the

process, for example; historically this domain has been populated with people who know what they're doing.

In the business context, it's a niche field, so (to some degree) the ecosystem is not yet mature. Janus Electric, for example, retrofit large trucks with interchangeable batteries. There's not a large body of experience locally to draw on, so the businesses are learning as they go, overcoming obstacles as they meet them. Early stage government support for businesses of this nature is likely to be crucial to their success. My understanding is that Janus has made the news with fires associated with their equipment – to our understanding there have been no injuries, and fire fighters have been able to resolve the fires when they have happened, but it would be appropriate to give some consideration to the root causes of these incidents, in order to minimise the likelihood of recurrence, and enable other entrants to the domain to avoid similar outcomes. Emma Sutcliffe or FRNSW may be able to comment further with respect to the specifics.