27th June 2023

Response to:

Electrical Safety Office, WorkSafe Queensland

A response to the Review of Queensland's Electrical Safety Act 2002 – key definitions and emerging technologies Discussion paper

Introduction

The Truck Industry Council (TIC) is an independent, not-for-profit peak industry organisation representing the united views of truck manufacturers, truck importers, heavy vehicle engine companies and major component suppliers to the Federal Government, State and Territory Governments, Local Government, industry, business associations and the general public.

Membership of TIC is inclusive of all truck manufacturers and importers/distributors in Australia and currently consists of:

i. 12 truck manufacturers/distributors representing 18 truck brands;
ii. 4 engine and component suppliers.

TIC members represented 99% of all truck sales above 4.5t GVM in 2022.

In 2023, the truck industry is designing, engineering, testing, developing, and manufacturing trucks at two major locations in Australia without Federal Government assistance. The companies involved, and their locations, are:

i. Paccar Australia, manufacturing Kenworth and DAF trucks at Bayswater, Victoria; and
ii. Volvo Group Australia, manufacturing Volvo and Mack brand trucks at Wacol, Queensland.

The two plants combined produce about 40% of all heavy duty trucks sold in Australia (TIC T-Mark Truck Market Sales Data 2022). Complementing these Australian based truck manufacturers are truck importers who deliver the majority of new trucks sold in Australia, importing from Asia, Europe, and the United States of America.

In combination TIC members provide trucks that meet the specific requirements of Australian operators who work in conditions unique to anywhere else in the world ensuring the efficient transportation of the nation's growing freight task.

TIC members support the decarbonisation of road freight transport, with a number of its members offering reduced or zero emission heavy vehicles.

TIC and its members take seriously the safety both to service technicians and the public that arise when servicing battery electric of hydrogen fuel cell vehicles.

TIC would like to comment on Section 3.3 which covers options for electric vehicles. The following are TIC's responses to the questions in the Electrical Safety Office discussion paper, followed by a section covering general discussion items.

Questions seeking feedback

1. How are you, your organisation, the workforce or community affected by the problems identified and to what extent?

TIC members in total have 16 battery electric truck models currently available on the Australian market.

Further, TIC is aware of a number of additional models from recent new entrants to the Australian market offering both battery electric and hydrogen fuel cell vehicles.

In the 12 calendar months prior to May 2022 less than 100 battery electric trucks were sold.

In addition, some TIC members have offered hybrid electric vehicles over the last decade. However, market penetration overall has not been significant with, the total number of hybrid electric vehicles already on the road over the last decade likely to be only around 1500.

As can be seen the market for reduced or zero emission heavy vehicles in Australia is still emerging. TIC and its members expect very modest growth for these vehicles in the short to medium term due to a number of factors.

a) Current vehicle regulations around maximum axle mass and vehicle width
a) Limitations of current technology, essentially limiting viability for metropolitan delivery, and skewed towards loads that are not mass constrained.

In fact, TIC and its members are of the view that only around 2% of the total number of heavy vehicles on the road by 2030 will be reduced or zero emission heavy vehicles. This equates to approximately 18,000 vehicles above 3.5t GVM by 2030.

2. Do you agree with the assessment of the problem identified, and are there additional risks presented by electric vehicles that have not been identified? If yes, what are they and can you provide examples of these issues*?*

As mentioned above, the market for BEV's and FCEV for heavy vehicles is emerging. Consequently, it's very difficult to quantify the extent of any issues relevant to this policy discussion. Further, the policy response document does not articulate any statistics that are applicable in a service context and how that compares to incidents when serving current ICE (diesel) trucks. Only mention of issues arising from collision and debris are acknowledged and quantified in the report. This is a potential issue for first responders and is being dealt with by those organisations, in consultation with vehicle manufacturers.

The following article suggest that the incidence of fires per vehicles sold for electric vehicles is considerably lower when compared to petrol vehicles:

Electric Vehicles Catch Fire Considerably Less Than Gas Cars (motorbiscuit.com)

Noting that the higher incidence on hybrid vehicles is due to the combination of two traction system, with a petrol fire also likely to ignite the lithium battery, which is close by.

TIC agree that the majority of battery incidents are due to collision and debris.

The discussion paper does imply dangers in relation to electrocution, however there are no statistics indicated, and with the number of reduced or zero emission vehicles being low, no statistics are available to justify any change to current automotive practices.

3. What practical impact, including the costs and benefits, would the options proposed in the Discussion paper have on you, your organisation, the workforce or the community? Please provide examples where possible.

Option 1

As this option promotes the status quo, the only cost would be the upskill training that would be required for the existing work force.

In the automotive industry, upskilling of vehicle service technicians is continual, particularly so when vehicle OEM's release new models. Further, with active participation of industry in developing TAFE courses, VET courses are under regular review and update cycles.

As pointed out in the policy response document, it is in the best interest of truck OEM' to ensure safe repairs through appropriate training. However, the heavy vehicle service and repair sector has a number of distinct differences to the light vehicle service sector.

a) Heavy vehicles tend to be manufactured from distinct sub components supplied by Tier 1 suppliers, who also sell and support the identical product directly in service. The main examples being:
    - Suspension assemblies
    - Gear boxes and drive trains
    - Brakes
    - Engines

a) All the above component suppliers are large multinational companies in their own right, that have resources and training capabilities on par with the truck OEM's themselves. They too offer service and repair services that complement those of the OEM offerings (particularly so in regional areas)

b) Some large transport operators have their own in-house service and repair facilities, often with truck OEM's or component supplier facilitating training of technicians.

c) A number of ICE manufacturers are developing electric traction systems, as well as a number of suspension assembly suppliers and drivetrain suppliers. It is expected that the situation where a truck OEM uses a traction system from a Tier 1 supplier and the same traction system might also be used by other truck brands, is very likely to continue into the future. This will mean that these products will have repair information widely available, as happens now with "customer" ICE drivelines.

d) Third party (Tier 1) service and repair organisations have a more prominent role in the heavy vehicle industry. In fact, a number of TIC members have agreements with third party service and maintenance suppliers in geographical regions where they do not have a sales dealership. These service organisations

receive full factory support and training. These service providers also may not necessarily have an exclusivity arrangement (that is, they can service multiple brands of trucks).

Consequently, the benefit in Option 1 is that the current make-up of the heavy vehicle service sector will facilitate the dissemination of training not only to dealerships, but also third-party service providers and truck operators, at no significant added cost, apart from creating new training content.

Option 2

This option would imply that a sole technician will need to be devoted to the service and repair of the traction system.

Given the low numbers of reduced or zero emission heavy vehicles in that market, this would not be a viable option for either a heavy vehicle OEM, third party repairer, or truck operator, to employ a technician who is only going to repair the electrical drive system.

Therefore, there would be three significant cost burdens, the cost of a licence, the cost of undertaking a specific apprenticeship, and the cost of having a technician idle for a significant amount of time. As an industry, the cost of setting up and ongoing management of a licensing system will need to be added over and above current maintenance costs.

Consequently, as it is not viable to employ a technician solely to undertake work on traction electrical traction system, the only practical solution is to upskill existing service technicians so that they can service ICE and electric vehicles. However, TIC does not support either the need for specific electrical licensing or the need to have "micro" licences.

As discussed elsewhere in this document, the vehicle industry repair sector already has the structures and processes to update training as new technologies arise, having done this successfully for decades without significant regulation.

Option 3

TIC believes that there is no benefit in this option and such implementation would only incur costs for intangible benefits. There is an erroneous assumption in this option that service technicians have no experience at all with electrical systems on vehicles and need to be "informed and empowered".

As discussed elsewhere, existing VET courses, on the job training and truck OEM training already cover electrical risk assessment and mitigation on existing systems. Option 1 will provide the additional formal training on traction systems that is required at a fraction of the cost of Option 3.

However, some public education may be of benefit.

4. What is your preferred option and why would it be best for you, your organisation and your stakeholders?

TIC prefer Option 1. Maintain the status quo. This would not compromise safety given the industry's track record on continual upskilling of vehicle service technicians. This has been achieved through a combination of VET courses, training provided by truck OEMs and component (Tier 1) suppliers and has been a successful approach employed for decades, within the existing balance of regulation.

Technicians in the automotive industry have already available, without excessive regulatory control, existing structures to keep up to date with vehicle technology as has arisen over the years. Many of these technologies are safety critical, increasingly reliant on complex electrical systems and have become mandatory fit on new vehicles. For example

- Mandating of advanced electronic brake systems (anti-lock brakes, stability control, autonomous emergency braking etc)
- Advanced driver aids – (lane keep assist, blind spot information systems etc)
- Increasing sophistication of emission control systems.

There are structures in the service and repair sector already to develop and deliver new training. In addition, there is already a mechanism to track qualification either through VET providers and vehicle OEM's who provide on the job and specialised training.

In some states, it is not only the service technician requires to be licenced, but also the workshop facility must be licenced as well.

Consequently, the only cost involved would to create new training materials, and the cost of undertaking the upskilling courses.

5. If a licensing framework was introduced:

a. Should any specific type of vehicle be excluded for the requirement (e.g., motorcycles, cars, buses, trucks)? If so, what are they and why?

If the intent is to manage risk around a traction system, then the vehicle type is not critical. Rather, it should be based on equipment fitted – that is battery and traction motor.

b. Is a restricted licence (specified training) or full licence (full apprenticeship) suitable? If so, why?

A full apprenticeship to only carry out only work to related to electrical traction systems is not practical given the pervious discussion about current through to mid-term market penetration of zero emission vehicles.

There will be insufficient work to employ a specialist technician given the small number of trucks already in the market and the expected slow uptake of zero emission heavy vehicles in the short to medium term.

Consequently, the only viable option is to up skill existing service technicians, who already have a significant understanding of electrical systems on vehicles. This will build on existing knowledge, and allow the technician to continue to service ICE's.

Further, no evidence has been presented that details a current, or pending, safety risk for servicing electric vehicles.

TIC also does not support the introduction of restricted licenses. As mentioned, current training structures adequately adapt to new vehicle technologies.

Further, if a licensing scheme is introduced, TIC suggest the adoption of training and competency frameworks that leverage existing apprenticeship pathways for automotive technicians. Licenses are to be held by automotive technicians rather than electrical trades. This is the favoured option in other parts of the world.

For example:

UK – Electric Vehicle Maintenance Standards (Three recommendations to Government)

USA – ASE Electrified Propulsion Vehicles – High Voltage Electrical Safety Standards

The US standard outlines a three-tiered approach (page 6)

c. Should the licence type be determined based on the type of vehicle? If so, what would you suggest and why?

It should be traction system specific, noting previous discussion around current ICE manufactures developing traction systems.

d. What types of work or occupations should be excluded from a licensing requirement? Or alternatively, what types of work or occupations should have specific licensing requirements (e.g., on-road works, general maintenance and check-ups, and/or removal and disposal)?

TIC would like to re iterate that we do not support any specific electrical licencing requirements.

e. Are there any elements under the Act which should not apply? Which sections and why?

TIC advocate no license requirements.

f. Are there situations in which a disconnect and connect restricted licence for performing work on non-propulsion components of a vehicle would be appropriate?

No - managing electrical safety on vehicles is already an inherent part of existing vehicle service technician training even in generic VET courses. As mentioned already, vehicles have been fitted with ever increasingly complex electrical systems of varying power demands. In in addition, heavy vehicles tend to have significantly higher power demands on most ancillary systems (e.g. needing to power extra lights on a trailer, electro mechanical servos operating large valves etc). European and the majority of Japanese sourced and designed ICE trucks currently have 24 V electrical systems (and have had such systems for decades).

Do you have suggestions for other options to address the problems identified? Please provide examples (including costs where appropriate) of your suggested options, including how it would ensure the workforce are electrically safe and conduct electrically safe work for community safety.

TIC does not have any suggestion outside Option 1. However, note discussion above regarding overseas approaches.

Are you aware of evidence of the dangers of particular forms/categories of ELV equipment? If so, what evidence is available?

Currently, no.

As mentioned, as the market is emerging it is difficult to quantify any dangers that may develop. Truck OEM's who are selling zero emission vehicles are working closely with their dealer service network and customers, closely monitoring vehicles in service.

In addition to close monitoring of vehicles by OEMs, there is also increased vigilance from regulators (National Heavy Vehicle Regulator) as many vehicles are running on exemptions regarding increased axle masses and vehicle width, in in anticipation of possible regulation change.

In any case, some manufactures have been selling hybrid vehicles in Australia for more than a decade and they are not aware of any systemic issues in relation to the dangers under discussion.

Given the amount of vigilance currently being conducted by both OEM's and regulators, no problems have been identified that require addressing.

Should certain ELV equipment be included in the scope of the Act's regulatory reach that are not currently covered?

No.

What approach to including ELV equipment within the scope of the ES framework should be adopted in Queensland?

ELV should continue to be exempt.

Should a measure of energy density/capacity be adopted? If so, which measure and what amount (e.g., how many watts per hour)?

No.

Are you aware of evidence of the dangers of particular forms/categories of ELV equipment? If so, what evidence is available?

No.

General Discussion

There is an underlying erroneous assumption in the policy document that automotive service technicians do not have any knowledge of electrical systems to adequately mange the risk of injury caused by an electrical traction system.

TIC would suggest that a modern vehicle has evolved over the last 3 decades into a sophisticated electro-mechanical device. Consequently, a vehicle service technician now must have detailed knowledge of both electrical and mechanical systems to be able to service a vehicle.

For example:

- Electronic engine management systems which also now tend to control other on board systems (e.g. anti-lock brakes, stability control and driver comfort systems amongst other systems)
- Electro-mechanical devices such as solenoids, that form part of vehicle systems such as stability control, anti-lock brakes which can at times draw significant electrical power when intermittently active.
- Electro hydraulic systems that control various equipment on trucks, such as tipping bodies, garbage collection bodies and so on. Some of these systems involve significant electrical energy to operate (e.g. electric hydraulic pumps)
- Electric motors being increasingly used in non-traction related functions. For example, electrically assisted steering (in lieu of hydraulic power steering) an to energise hydraulic systems previously done via a power take off gear from the ICE (PTO).

Several safety systems use electro mechanical components, some of which of themselves are high risk if not deactivated and then serviced correctly. Light vehicles for example, are now universally fitted with air bags, which all have an explosive charge. To disable an airbag system requires the deactivation of the electrical control system that triggers the explosive charge to deploy the air bags. No licensing arrangements to handle such explosive charges have been put in place with existing training structures adequately addressing this risk.

Many of these technologies have been used for a number of years, and the heavy vehicle repair sectors has managed these risks without heavy handed regulation.

The industry, vehicle regulators and training providers have been pro-actively developing various safety frameworks to mitigate the risk under discussion. For example:

1. Prosed introduction of two electric vehicle related Australian Design Rules:
    a. ADR 109/00 - Electric Power Train Safety Requirements
    b. ADR 110/00 - Hydrogen-Fuelled Vehicle Safety Related Performance
2. Recently completed comprehensive revision of AS5732-2015 (now AS 5732-2022) Electric Vehicle Maintenance and Repair (TIC being part of the technical committee that reviewed the standard)

Development of VET and training courses:

3. AURETH101 -Depower and reinitialise battery and electric vehicles
4. AUR32721 – Certificate III in Automotive Electric Vehicle Technology

In the short term, as explained previously, demand for BEV's and FHEV is low and likely to remain low through to the medium term. The TIC members that are selling reduced or zero emission vehicles have already invested in appropriate training.

The additional licensing proposal will only serve to increase costs for the transportation industry, further delaying the uptake of zero emissions vehicles, and will have no impact on the issues under discussion, considering:

- The small market penetration of zero emission heavy vehicles.
- OEM's that are selling ZEV have already undertaken training with their technicians.
- Training for third party repairers is already available, noting the discussion around the nature and make-up of the heavy vehicle repair sector discussed elsewhere in this submission.

Summary

It is difficult to see how a licensing structure will improve safety for reduced or zero emission vehicles given that:

- Vehicle design is already highly regulated through the Road Vehicle Standards Act and will continue to be, through the introduction of additional EV specific ADR's as mentioned above.
- The vehicle industry is one of the fastest adopters of new technologies, and has training structures in place to quickly train technicians in these new technologies. The speed of technology adoption is not a "new thing" in the automotive industry, and this speed has simply been part of the industry for decades.
- Current shortages of Electrical trades is well documented[1]. Requiring a licensed electrical trade to service vehicles will only exacerbate the current shortage. It will delay vehicle repairs and add a layer of cost that is unjustified, given the level of base expertise that the automotive technician already has. The most cost effective and safest solution is to upskill existing automotive service technicians, who already have a deep understanding of how electrical systems behave and interact in a vehicle.

If further information is sought, please do not hesitate to contact me.

Regards

[redacted]
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[1] https://workfast.com.au/blog/skills-shortage-electricians-in-australia/