
FCAI Submission - Resources Safety and Health Queensland:

Developing a Hydrogen Safety Code of Practice



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November 2021

INTRODUCTION

The Federal Chamber of Automotive Industries (FCAI) welcomes the opportunity to provide input into Resources Safety and Health Queensland's discussion paper – Developing a Hydrogen Safety Code of Practice.

FCAI commentary will only be specific to certain elements of the discussion paper concerning the Code of Practice as it pertains to light duty motor vehicles (passenger cars and light commercial vehicles) and motorcycles.

The FCAI is the peak Australian industry organisation representing over 50 global automotive brands who design, manufacture, and sell light duty passenger vehicles, light commercial vehicles, and motorcycles around the world. Presently, the FCAI within its membership has several brands who have announced and are continuing the development, commercialisation, and introduction of Fuel Cell Electric Vehicles (FCEV).

To put the Australian automotive market in context, Australia receives our automotive products from global manufacturers and in a typical year with sales of just over 1 million vehicles annually, Australia represents just over 1% of global sales (90 million vehicles 2019¹). Therefore, to maintain the significant variation of vehicle models that consumers in Australia have access to, it is imperative that we harmonise with international regulations.

The automotive industry in general, and the FCAI membership specifically has and continues to make significant contributions towards advanced products being made available in Australia. Our members are developing advanced powertrain technologies in line with international regulations and standards that are specific to and unique to the automotive industries operating environment. Of course, it is development of these products to these global standards that ensures that our products are provided to the market in the safest possible manner. Given the leadership of the automotive industry, these international standards are usually developed well in advance of vehicle production and often provided to market in advance of and exceeding minimum regulatory standards or non-regulatory processes.

In that sense, our commentary will be specific to hydrogen safety as it pertains to fuel cell technologies used in automotive applications specifically and we will comment only on:

- Safety Regulatory Frameworks by Hydrogen Use
- Gas Devices and Approvals
- Gas Work Licences
- Hydrogen Delivery Networks – Hydrogen Fuel Stations

We forward to continuing engagement with Queensland Resources Safety and Health where we can support with our expertise across the automotive industry to ensure that Fuel Cell Electric Vehicles can operate Australia wide in a safe manner that is typical of automotive products.

¹ OICA

EXECUTIVE SUMMARY KEY POINTS

- Automotive products are designed to international vehicle standards.
- FCAI supports federal type approval that enables vehicles to be registered for use in each of the States and Territories regardless of the powertrain system utilised.
- FCAI does not support the inclusion of road vehicles into the definition of “plant and equipment” as proposed by Resources Safety and Health Queensland.
- FCAI does not support the requirement to seek individual product approval by a GDAA.
- Automotive products are designed according to automotive requirements, and we do not support the requirement to hold a gas work licence (for type B devices).
- Manufacturers ensure that extensive training is undertaken to ensure that the technicians working on these products are fully aware of the inherent risks and competent in correct practices using appropriate equipment.
- Fuel quality for automotive Fuel Cell Applications should be specified according to ISO 14687:2019

SAFETY REGULATION FRAMEWORK BY HYDROGEN USE

Presently, the introduction of Fuel Cell Electric Vehicles (FCEVs) is at the very initial introduction phase, aimed at demonstrating the capabilities of these FCEV powertrain products primarily to Governments and pioneering businesses to build awareness of and support for the technology. These vehicles are not generally available for public purchase and are constrained by the extremely limited availability of the refuelling infrastructure that is necessary for them to operate.

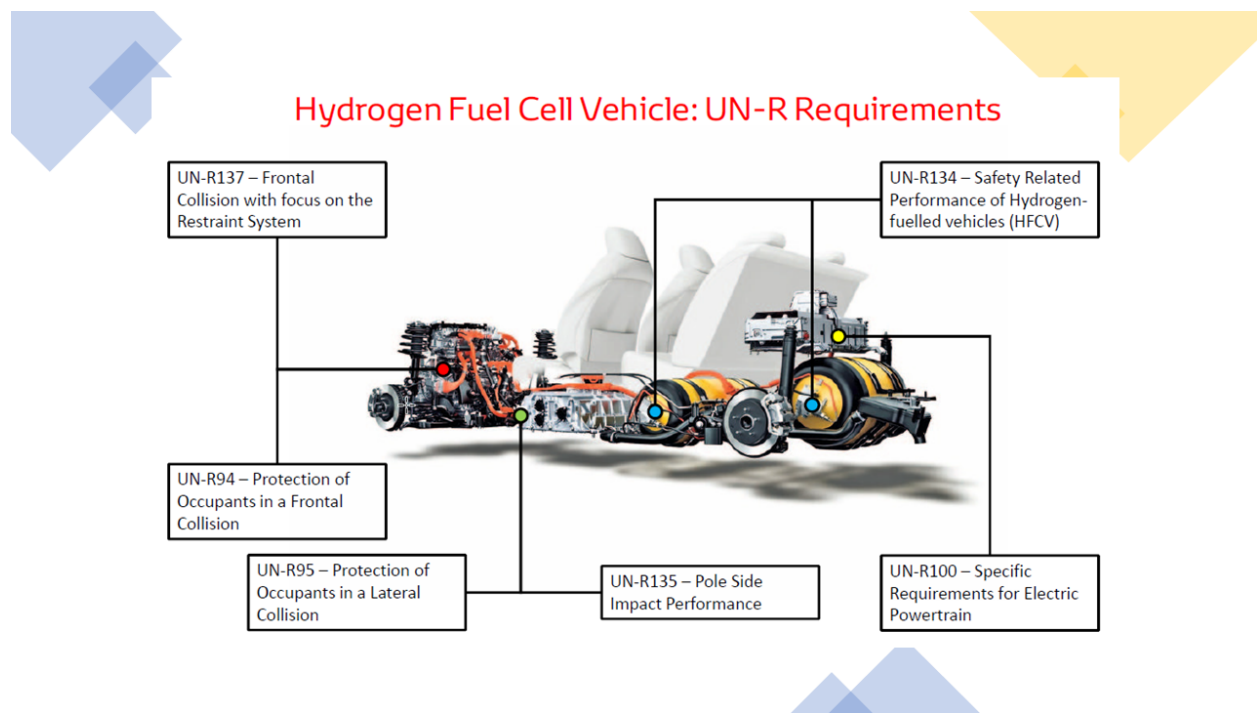
At first provision to the Australian market, road vehicles are regulated federally, through the type approval system ensuring that they meet all current, applicable Australian Design Rules (ADRs) regardless of the powertrain system and propulsion fuel utilised. Under the Type Approval system, States and Territories agree that vehicles that have been granted compliance approval federally and continue to meet the conditions of their approval in-service, will be permitted to be registered for use on roads within Australia.

GAS DEVICES AND APPROVALS

FCAI does not agree that FCEVs used in automotive applications should be classified under “plant and equipment” or being defined as a Type B device. We consider that they should more appropriately be harmonised with the national vehicle safety standards and approved through the Commonwealth as motor vehicles currently are regardless of the fuel system type used.

Given the unique operation of motor vehicles and the significant interaction between various international regulations, if the vehicles are complied with these international standards, then there should be no requirement for a State based approval system.

Motor Vehicles are designed globally to meet international safety standards and any unique applicable Australian Design Rules. A graphic of the UN regulations that a Fuel Cell Electric Vehicle would need to comply with is as follows:



It should be noted that Hydrogen specific regulations are only one aspect and that there is the inevitable interaction between multiple UN Regulations that in our view would be well outside the scope of unique State based regulations.

The following is a brief description of the UN regulatory system that automotive manufacturers operate within and the interaction with Australia's international obligations:

World Forum for the harmonization of vehicle regulations (Working Party 29)

The UNECE World Forum for Harmonization of Vehicle Regulations (WP.29) is a unique worldwide regulatory forum within the institutional framework of the UNECE Inland Transport Committee. Three UN Agreements, adopted in 1958, 1997 and 1998, provide the legal framework allowing Contracting Parties (member countries) participating in the WP.29 sessions to establish regulatory instruments relating to motor vehicles and motor vehicle equipment:

1. UN Regulations, annexed to the 1958 Agreement;
2. United Nations Global Technical Regulations (UN GTRs), associated with the 1998 Agreement; and
3. UN Rules, annexed to the 1997 Agreement.

UN Regulations contain provisions (for vehicles, their systems, parts, and equipment) related to safety and environmental aspects. They include performance-oriented test requirements, as well as administrative procedures. The latter address the type approval (of vehicle systems, parts, and equipment), the conformity of production (i.e., the means to prove the ability, for manufacturers, to produce a series of products that exactly match the type approval specifications) and the mutual recognition of the type approvals granted by Contracting Parties.

UN GTRs contain globally harmonized performance-related requirements and test procedures. They provide a predictable regulatory framework for the global automotive industry, consumers, and their associations. They do not contain administrative provisions for type approvals and their mutual recognition.

UN Rules concern periodical technical inspections of vehicles in use. Contracting Parties reciprocally recognize (with certain conditions) the international inspection certificates granted according to the UN Rules.

Objectives

Overall, the regulatory framework developed by the World Forum WP.29 allows the market introduction of innovative vehicle technologies, while continuously improving global vehicle safety. The framework enables decreasing environmental pollution and energy consumption, as well as the improvement of anti-theft capabilities.

The same regulatory framework is also instrumental for fostering and facilitating cross-border trade, since provisions established under the 1958 Agreement include the obligation for reciprocal acceptance of approvals of vehicle systems, parts and equipment issued by other Contracting Parties (the reciprocal recognition of the entire vehicle is not yet possible under the 1958 Agreement, even if procedures for the whole vehicle type approval of vehicles have been established in EU Member States. In order to address this issue, WP.29 launched the International Whole Vehicle Type Approval (IWVTA) project in March 2010).

Australia is a signatory to both the UN [1958 Agreement](#) and the [1998 Agreement](#). The Australian Government's policy is to harmonise its national vehicle safety standards, the Australian Design Rules (ADRs) with international regulations where possible and first consideration is given to the adoption of the international United Nations (UN) regulations. The policy to harmonise is also important in fulfilling Australia's World Trade Organisation and Asia Pacific Economic Cooperation commitments.

The Commonwealth's domestic regulatory framework also allows some small volume, concessional participants to provide vehicles to the Australian market with a lower burden of evidence of compliance with the ADRs. As a result, it is FCAI's belief that these Specialist and Enthusiast Vehicles represent a higher risk and, as such, Queensland should prevent the registration and use of any concessional scheme vehicle equipped with a hydrogen fuel cell powertrain.

GAS WORK LICENCES, AUTHORISATIONS AND COMPETENCIES

Automotive vehicles constructed with hydrogen fuel cell technology are designed specifically to enable disassembly and reassembly that is necessary for all automotive products where reasonably foreseeable events occur such as:

- Servicing / Maintenance requirements
- Routine repair requirements
- Accident repair requirements

Vehicles

The hydrogen fuel cell vehicles produced by automotive manufacturers contain numerous safety devices that allow for multiple points of sensing for hydrogen leaks with automated shut down systems should a leak be detected. In addition, the extremely high-pressure elements of the system are restricted to the fuel tank, filling system and the primary pressure reducing outlet valve.

Componentry

All components of the Hydrogen fuel system can be replaced without the need for the specialist skills associated with typical gas fitting operations such as welding, soldering, swaging or similar. However, there may be specialist automotive skills required.

All connectors used in Fuel Cell Electric Vehicles (FCEV) are specifically designed for automotive application and are fitted with connectors suitable for the application with replaceability in mind. In the event of service, maintenance or repair each component sub-assembly can be removed from the vehicle and replaced. In some cases, achieving this may require the use of specialised knowledge, equipment, tools and training specific to an automotive manufacturer not generally available to gas fitting trades or similar.

Training

All automotive manufacturers go to extensive lengths to ensure that safety procedures are put in place through their dealer networks that cover all the areas of potential concern associated with introducing a new technology such as an FCEV.

- In the initial instance only selected service and repair facilities will be approved and these facilities will have committed to at a minimum:
 - Investment in the infrastructure to ensure safe repair facilities.
 - Facility and site safety assessments
 - Investment in the Special Service Tools (SSTs) required for service and repair.
 - This will include sensing equipment to investigate and detect Hydrogen leaks.
 - Investment in the diagnostic equipment necessary to diagnose faults and confirm operational parameters.
 - Invested in undertaking manufacturer approved training courses to assure competence in undertaking service and repairs on these vehicles. It should be noted that there are a range of competencies necessary for these vehicles:
 - Firstly, there is the need to have a substantial level of knowledge of advanced automotive skills and principles with a high level of competency.
 - Secondly, there is a need to understand the Hydrogen system operation, service, and repair as well as understanding all of the safety risks, using appropriate Personal Protective Equipment (PPE).
 - Thirdly, FCEV's using Hydrogen as the fuel source are also Electric Vehicle (EVs) and therefore there is a need for the automotive technician to be well versed and trained in all aspects of EV operation again understanding the safety risks and using their extensive knowledge of EV operation, PPE, and SSTs to ensure safe operation, service, and repair.

- Whilst the industry has not progressed to broad deployment of this technology at this stage based on the emergent status, broader skills development will be undertaken by the manufacturers as the products progress beyond the demonstration phase.

- The automotive industry will work through the Australian Industry Skills Committee (AISC) and associated skills training development networks to ensure that training is made available in line with the expected level of product availability and needs within the broader service and repair market.

We should also note that in the most recent amendments to the Competition and Consumer Act for the requirements for manufacturers (as "Data Providers") to make available service and repair information, there is an exclusion permitting manufacturers to restrict the supply of service and repair information relating to the Hydrogen Fuel System to those technicians suitably qualified.

HYDROGEN DELIVERY NETWORKS INCLUDING FUEL STATIONS

Automotive manufacturers have advised FCAI that their Fuel Cell systems require an extremely high level of Hydrogen purity to ensure efficient and durable operation typically expected from automotive products that will be in the market for over 10 years.

Hydrogen purity is specified in the International Standards Organisation ISO 14687:2019 - this document specifies the minimum quality characteristics of hydrogen fuel as distributed for utilization in vehicular and stationary applications.

It is our understanding that introduction of an odourant will compromise the Hydrogen purity putting at risk the long-term performance and durability of automotive FCEV systems. FCAI and our members will only support fuel quality that meets the requirements of this International Standard.

End Of Submission.