# Hydrogen fuel cell – Guidelines for developing a Technical Submission for approval in Western Australia

## Introduction

In Western Australia Hydrogen fuel cells are classified as a Type B gas appliance and will require approval if installed in a consumer installation. For instance, if the gas is supplied by a gas supplier.

This guideline has been developed to assist the gas industry with the minimum required technical information to be considered and included in their technical submission for the purpose of assessment and approval of a typical Hydrogen fuel cell.

For guidance on Hydrogen fuel cell gas safety regulation requirements in WA, please refer to: Hydrogen fuel cell safety regulations in WA | Department of Mines, Industry Regulation and Safety (commerce.wa.gov.au).

For applicable Hydrogen fuel cell standards please refer to the Western Australian Government Gazette No.45 published on 29 March 2022, which details standards that are to be used as a benchmark for Hydrogen fuel cells.

## Technical considerations

The technical submission required for a Hydrogen fuel cell will depend on the design, complexity, location and application of the appliance. However, as a minimum and where relevant, the following is required to be provided to the Designated Type B Appliance Inspector:

- Appliance original equipment manufacturer (OEM) details.
- Appliance type, model, serial number, output capacity, operation and process description.
- Contact details of the engaged gas fitter (and commissioning person if different).
- Address and location where the appliance is to be installed.
- Contact details of owner, operator or proposed operator.
- Name and address of organisation(s) responsible for the risk assessment (including participants).
- A written form of risk assessment to ensure all hazards are eliminated or reduced to an acceptable level.
- The risk assessment should include:
  - functional safety according to the applicable standard; and
  - failure Mode and Effects analysis according to the applicable standards.
- Competent appliance designer details (name, organisation, qualification, contact number and email), should include the below engineering as a minimum:
  - process/chemical, mechanical, electrical and instrumentation.
- Instructions for installation, operation and maintenance.
- Appliance marking plate details.
- Process and instrumentation diagrams.
- Nominal gas consumption rate.
- Applicable Fuel Cell Stack Module approved standard.
- Evidence that the electrical system design, construction, and the electrical and electronic components are compliant with the relevant electrical product application standards.
- Details of purge medium, its flow rate and purge periods.
- Details of any pressure reliefs and discharge vents; including location and cross- sectional area calculations.
- Schematic drawing(s) of the unit, including the upstream inlet valve train specifying all components.
- Compliance document for hazardous area assessments, compliant with Australian or Australian/New Zealand Standards.

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- Compliance documentation for any Programmable Electrical System (PES) or Programmable Logic Controls (PLC).
- Details of enclosure, its ventilation requirements and methods of provision.
- Details of discharge vent line design and its location requirements.
- Details of leak detection provision, include manufacturer, model, serial number, date of manufacturer, leak sensor type (leak/pressure/other), design standard, approval/certification number, approval body/organisation, description and drawings.

For further guidance on a typical Type B gas appliance approval process refer to: Guidelines for the approval of industrial gas appliances (Type B appliances).

## List of some additional safety requirement and guidance standards

### Safety requirements:

- AS/NZS 60079.0 Part 0 'Equipment — general requirements'.
- AS/NZS 60079.10.1 'Explosive atmospheres', Part 10.1 'Classification of areas — explosive gas atmospheres'.
- AS 61508 'Functional safety of electrical/Electronic/programmable electronic safety-related systems' Parts 0 to 7.
- AS/IEC 61511 'Functional safety — safety instrumented systems for the process industry sector', Parts 1, 2 and 3.

### Guidance standards:

- AS 62282.3.300:2021 Fuel cell technologies, Part 3.300: Stationary fuel cell power systems – Installation (IEC 62282-3-300:2012 (ED.1.0),MOD).
- NFPA 2 – Hydrogen Technologies Code.
- EIGA Doc 211/17 – Hydrogen vent systems for customer applications.
- ASME B31.12 – Hydrogen Piping and Pipelines.
- SA TS 19883 Safety of pressure swing adsorption systems for hydrogen separation and purification.
- AS 26142:2020 Hydrogen detection apparatus – Stationary applications.
- AS 16110 series Hydrogen generators using fuel processing technologies.
- AS 4041-2006 Pressure piping.
- ISO 15649 Petroleum and gas industry piping.
- AS/NZS IEC 60079 series.

Should any clarification be required about this document, please contact the Principal Engineer Gas Utilisation on 6251 1900 or be.energy@dmirs.wa.gov.au.



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