



Australian Government

CPCPGS3026 Assess operational risk when working with hydrogen

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Modification History

Release	Comments
1	This unit of competency was first released in CPC Construction, Plumbing and Services Training Package Release 11.0.

Application

This unit describes the skills and knowledge required to identify, analyse and evaluate risks associated with hydrogen storage systems, pipework and appliances in a plumbing and services environment, including establishing the risk context and determining appropriate control measures.

Licensing/Regulatory Information

No licensing, legislative or certification requirements apply to this unit at the time of publication.

Pre-requisite unit(s)

No pre-requisite units

Competency field(s)

N/A

Unit sector(s)

Plumbing and services

Elements and Performance Criteria

Elements	Performance Criteria
<i>Elements describe the essential outcomes.</i>	<i>Performance criteria describe the performance needed to demonstrate achievement of the element. Required knowledge, skills and application should be considered and clearly articulated.</i>

1. Establish the risk context for hydrogen-related work	1.1 Identify risk assessment objectives and the scope of the risk assessment in accordance with safety regulations and relevant standards 1.2 Identify and document risk criteria, including likelihood, consequence and acceptability thresholds, in accordance with workplace risk management procedures and work health and safety (WHS) requirements
2. Identify hazard	2.1 Identify and record hazards associated with hydrogen storage, pipework and appliances in accordance with safety regulations and standards 2.2 Identify and record potential consequences of identified hazards, including safety, environmental and operational impacts, in accordance with WHS requirements
3. Analyse risk	3.1 Assess the likelihood of each identified consequence occurring using workplace risk assessment methods and criteria 3.2 Assess the severity of potential consequences using workplace-approved or industry-recognised risk matrices relevant to hydrogen systems 3.3 Determine and document the inherent level of risk for each identified hazard in accordance with established risk criteria and workplace procedures
4. Evaluate risk	4.1 Identify and select control measures for each identified hazard in accordance with the hierarchy of control, WHS requirements and relevant standards 4.2 Re-evaluate the severity and level of residual risk after controls are applied using workplace-approved risk matrices and risk criteria 4.3 Document risk assessment outcomes, including identified hazards, applied controls and residual risk levels, in accordance with workplace documentation requirements

Range of conditions

N/A

Assessment Requirements for CPCPGS3026 Assess operational risk when working with hydrogen

Performance Evidence

To demonstrate competency, a candidate must meet the performance criteria for this unit by completing at least **two** (2) documented hydrogen risk assessments, covering:

- **one** (1) new installation scenario that includes cylinder, pipework and appliance, and
- **one** (1) existing installation scenario that includes either conversion of gas type, maintenance, or purging processes, and
- identify at least **five** (5) hazards per scenario.

Knowledge Evidence

To be competent in this unit, a candidate must demonstrate knowledge of:

- work health and safety (WHS) regulations for hazard identification, risk assessment and control measures relevant to hydrogen work
- relevant Australian Standards for gas installations as they relate to assessing risk and determining appropriate controls
- risk profiles or criteria including:
 - how likelihood is defined
 - the level at which risk becomes acceptable or tolerable
 - the nature and types of causes and consequences that can occur and how they will be measured
 - risk mitigation and how the level of risk is determined
- hydrogen properties and behaviour, including:
 - flammability limits
 - ignition temperature
 - low ignition energy and implications for static control and exclusion zones
 - flame temperature and heat radiation considerations
 - flame speed and implications for flashback risk
 - invisibility/low visibility of hydrogen flames and detection/response implications
 - relative density low molecular weight and buoyancy, and implications of accumulation
 - permeability of hydrogen through materials
- hazards associated with hydrogen and their implications for risk assessment including:

- leak detection limitations for non-odorised hydrogen
 - fire, explosion, and asphyxiation risks
 - effects of leaks and high-pressure release
 - elevated storage pressures
 - static electricity and other ignition sources
 - material compatibility and potential issues, including hydrogen embrittlement affecting metals and seals
- safe work practices relevant to assessing risk and determining appropriate control measures when working with or near hydrogen sources, including:
 - exclusion zones
 - ventilation
 - detection of non-odourised gas
- storage and handling considerations relevant to risk assessment and control selection, including:
 - approved storage vessels (cylinders)
 - site selection
 - pressure ratings
 - certification
 - separation distances and clearances for hydrogen storage
 - supports and bases
 - ventilation requirements
 - static control
 - protection of stored hydrogen from damage or tampering.

Assessment Conditions

Assessment must occur in workplace operational situations where appropriate; where this is not appropriate, assessment must occur in simulated workplace operational situations that replicate workplace conditions.

Mandatory Workplace Requirements

Assessment of performance evidence may be in a workplace setting or an environment that accurately represents a real workplace.

Unit Mapping Information

Previous Code and Title	Equivalence	Comments
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	Newly created	This unit has been created to address a skill or task required by industry that is not covered by an existing unit of competency
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Links

Companion volumes, including implementation guides, are found on the national training register - <https://training.gov.au/training/details/CPC>.