



Australian Government

UEGNSG902 Commission, operate and maintain electrolyzers

Release: 1

UEGNSG902 Commission, operate and maintain electrolyzers

Modification History

Release 1. This is the first release of this unit of competency in the UEG Gas Industry Training Package.

Application

This unit involves the skills and knowledge required to commission, operate and maintain electrolyzers to produce hydrogen in a hydrogen plant environment in accordance with relevant industry standards, regulations, manufacturer instructions and workplace procedures.

It includes following procedures to carry out the work correctly and safely, using appropriate materials, tools and equipment.

The application of the skills and knowledge described in this unit may require a licence/registration to practise in the workplace.

Other conditions may apply under state and territory legislative and regulatory licensing requirements which must be confirmed prior to commencing this unit.

Pre-requisite Unit

Not applicable

Competency Field

Hydrogen

Unit Sector

Gas Industry

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to commission, operate, and maintain electrolyzers

PERFORMANCE CRITERIA

Performance criteria describe the performance needed to demonstrate achievement of the element.

1.1 Relevant manufacturers' instructions and specifications, emergency procedures, industry codes, standards and regulations are obtained and confirmed

- 1.2 Hazards and WHS/OHS risks are identified and prioritised and control measures implemented and monitored
 - 1.3 Relevant person/s are consulted and work is prioritised and sequenced for completion within agreed timeframes and to industry standards in accordance with workplace procedures
 - 1.4 Work health and safety (WHS)/occupational health and safety (OHS), environmental and sustainable energy policies and procedures for the work are obtained and applied
 - 1.5 Work schedule/s, drawings, plans, job requirements and material lists are obtained, analysed and site inspection conducted, as required, to determine the preparation work required for planning and coordination
 - 1.6 Appropriate equipment, tools and personal protective equipment (PPE) required for the job are obtained and checked for correct operation and safety in accordance with workplace procedures
 - 1.7 Work area is prepared to minimise risk and damage to property, commerce and individuals in accordance with job instructions, work schedule and workplace procedures
 - 1.8 Electrolyser and associated equipment, pipework and storage are confirmed for correct installation
- 2 Commission and operate electrolyzers**
- 2.1 Regular checks are undertaken in accordance with manufacturers' instructions and specifications, industry codes, standards and regulations
 - 2.2 Relevant manufacturers' instructions and specifications, emergency procedures, industry codes, standards and regulations are implemented
 - 2.3 WHS/OHS risk control measures and policies and procedures are followed in accordance with workplace procedures
 - 2.4 Hazardous activities are performed safely in accordance with job instructions, regulatory requirements and workplace procedures, and manufacturers' instructions and specifications.

- 2.5 Electrolyser is commissioned and operated in accordance with manufacturer instructions, workplace procedures and job requirements
- 2.6 Materials, tools, equipment and devices to perform the work are selected and used correctly and safely in accordance with manufacturer instructions and workplace procedures
- 2.7 Unplanned events are dealt with or referred to authorised person/s for directions in accordance with level of responsibility and workplace procedures
- 2.8 Alarm codes, signage and other hazard warnings are correctly recognised and WHS/OHS risks and control measures monitored, actioned and appropriate authorities consulted in accordance with requirements and workplace procedures
- 2.9 Emergency shutdown procedures are applied in the event of equipment faults/failure or operational parameters being exceeded
- 2.10 Quality and safety checks of the work are conducted in accordance with job requirements, industry standards and workplace procedures

3 Maintain electrolyzers

- 3.1 WHS/OHS risk control measures and policies and procedures are followed in accordance with workplace procedures
- 3.2 Materials, tools, equipment and devices to perform the maintenance work are selected and used correctly and safely in accordance with manufacturer instructions and workplace procedures
- 3.3 Systems isolation is performed, as required, in accordance with requirements and workplace procedures
- 3.4 Electrolyser is maintained and parts replaced as required, in accordance with job requirements, level of responsibility, workplace procedures and manufacturer instructions
- 3.5 Electrolyser is recommissioned to safe operational conditions in accordance with job requirements, workplace procedures and manufacturer instructions
- 3.6 Unplanned events are dealt with or referred to authorised

	person/s for directions in accordance with level of responsibility and workplace procedures
	3.7 Quality and safety checks of the work are conducted in accordance with job requirements, workplace procedures and community and industry standards
4 Complete work and relevant documentation	4.1 Work area is cleaned up, made and confirmed safe in accordance with job instructions and workplace procedures
	4.2 Tools, equipment and any surplus resources and materials are cleaned, checked and returned to storage in accordance with workplace procedures
	4.3 Relevant person/s are notified of work completion in accordance with workplace procedures
	4.4 Work completion records and report forms are completed in accordance with job instructions and workplace procedures

Foundation Skills

Foundation skills essential to performance are explicit in the performance criteria of this unit of competency.

Range of Conditions

Range is restricted to essential operating conditions and any other variables essential to the work environment.

Non-essential conditions may be found in the UEG Gas Industry Training Package Companion Volume Implementation Guide.

Unit Mapping Information

This is a new unit.

Links

Companion Volume Implementation Guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=6a6c032e-ffcb-4f3d-8063-415efbd261e8>

Assessment Requirements for UEGNSG902 Commission, operate and maintain electrolyzers

Modification History

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Performance Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - emergency response procedures
 - sustainable energy and environmental principles and practices
 - hazard identification and reporting
 - hydrogen specific electrical hazard control measures and earth protection
 - implementation of risk control measures
 - selection and use of correct personal protective equipment (PPE)
 - safely working with hazardous materials and equipment
- applying sustainable energy and environmental principles and practices
- checking water supply and waste water systems
- commissioning and operating electrolyzers
- communicating with relevant stakeholders, including:
 - authorised persons
 - authorities
 - clients
- completing work and relevant documentation
- complying with regulations, industry standards, legislative requirements, codes of practice, manufacturers' instructions, recommendations and specifications, and environmental requirements
- conducting quality and safety checks
- dealing with unplanned events/situations in accordance with workplace procedures in a manner that minimises risk to personnel and equipment
- discharging oxygen safely
- following workplace procedures
- obtaining and using relevant equipment and tools, including:
 - alarm and communication equipment
 - fittings

- gas analysis equipment
- hand tools
- leak detection
- personal protective equipment (PPE)
- testing equipment
- safety valves
- performing electrolyzers maintenance
- performing stray current testing and protection
- recommissioning electrolyzers to safe operational conditions in accordance with job requirements and workplace procedures
- replacing parts and components in accordance with job requirements, level of responsibility and workplace procedures
- reporting problems encountered to appropriate person/s
- shutting down electrolyser operation
- undertaking systems isolation.

Knowledge Evidence

Evidence required to demonstrate competence in this unit must be relevant to and satisfy all of the requirements of the elements and performance criteria and include knowledge of:

- electrolysis processes including:
 - alkaline electrolysis
 - polymer electrolyte membrane (PEM) electrolysis
- electrolysis system components
- electrical safety, including:
 - principles of Ohms Law
 - stack discharge
- gas conditioning
- gas industry drawings, plans and material lists
- hydrogen physical and chemical characteristics
- plant and equipment in a hydrogen environment, including:
 - alarm and communication equipment
 - fittings
 - gas analysis equipment
 - hand tools
 - leak detection
 - testing equipment
 - water backflow prevention
 - water treatment equipment
- permit to work systems for a hydrogen environment
- principles of safe purging

- principles of electrolysis
- regulations, industry standards, legislative requirements, codes of practice, manufacturers' instructions, recommendations and specifications, and environmental requirements
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes
- relevant stakeholders, including:
 - authorised persons
 - authorities
 - clients
- relevant WHS/OHS legislated requirements, including:
 - applicable emergency equipment and procedures
 - hazardous areas
 - hazards, risk assessment and control measures
 - environmental and sustainable energy principles and practices, including:
 - green hydrogen
 - blue hydrogen
 - grey hydrogen
 - brown hydrogen
- relevant workplace documentation
- quality and safety checks
- relevant workplace policies and procedures
- safe handling of gaseous oxygen
- technical drawings for the hydrogen environment
- working safely in a hydrogen environment.

Assessment Conditions

Assessors must hold credentials specified within the Standards for Registered Training Organisations current at the time of assessment.

Assessment must satisfy the Principles of Assessment and Rules of Evidence and all regulatory requirements included within the Standards for Registered Training Organisations current at the time of assessment.

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

Assessment processes and techniques must be appropriate to the language, literacy and numeracy requirements of the work being performed and the needs of the candidate.

Resources for assessment must include access to:

- a range of relevant exercises, case studies and/or other simulations
- relevant and appropriate materials, tools, equipment and personal protective equipment (PPE) currently used in industry

- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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