



Australian Government

UEGNSG103 Install and commission stationary gas fuelled turbine engines

Release: 1

UEGNSG103 Install and commission stationary gas fuelled turbine engines

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 install and commission stationary gas fuelled turbine engine, up to a capacity of 5 gigajoule per hour (GJ/hr) (1,300 kilowatt).

It includes installing and commissioning stationary gas fuelled turbine engine to installation industry standards matching the plant/equipment, location, components and fuel train pipe-work to given specifications. Commissioning gas fuelled turbine engine plant and equipment includes pre-commissioning tests, start up, adjusting components and controls to safe and efficient operation, and completing all necessary installation and commissioning documentation.

The application of the skills and knowledge described in this unit may require a license or permit to practice in the workplace.

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

Pre-requisite Unit

CPCCWHS1001 Prepare to work safely in the construction industry

HLTAID009 Provide cardiopulmonary resuscitation

Competency Field

Cross Discipline Units

Unit Sector

Gas Industry

Elements and Performance Criteria

ELEMENTS

PERFORMANCE CRITERIA

Elements describe the essential Performance criteria describe the performance needed to

outcomes.

demonstrate achievement of the element.

1 Prepare to install stationary gas fuelled turbine engine

- 1.1** Work health and safety (WHS)/occupational health and safety (OHS) workplace procedures for a given work area are identified, obtained and applied
- 1.2** Hazards are identified, risks are assessed and existing risk control measures and workplace procedures are implemented in preparation for work
- 1.3** Safety hazards that have not previously been identified are noted on job safety assessments and existing risk control measures are implemented
- 1.4** Design specification for proposed gas fuelled turbine engine installation is accessed, analysed, interpreted and confirmed during site inspection
- 1.5** Design specification matters requiring clarification are resolved in consultation with designer and relevant gas authorities
- 1.6** Formal authority to proceed with installation and commissioning is obtained before commencing work in accordance with regulatory and code of practice requirements
- 1.7** Installation is prepared in consultation with person/s affected by work activity and sequenced appropriately in accordance with quality assurance requirements
- 1.8** Scope, nature and location of the work is determined from documentation or relevant person/s
- 1.9** Gas fuelled turbine engine plant, equipment and component specifications and manufacturer manuals are obtained for planned work activity
- 1.10** Locations of plant, equipment, fuel train pipe-work and components are planned within the constraints of work site, significant and requirements
- 1.11** Gas fuelled turbine engine materials needed for the installation work are obtained in accordance with design specification and workplace procedures
- 1.12** Tools, equipment, personal protective equipment (PPE) and testing devices needed to for installation and commissioning work are obtained in accordance with workplace procedures and checked for correct operation

and safety

1.13 Work area is prepared for installation of gas fuelled turbine engine plant and equipment

1.14 Preparatory work is checked to ensure no damage has occurred and complies with job requirements and specifications

2 Install stationary gas fuelled turbine engine

2.1 WHS/OHS risk control measures and workplace procedures for carrying out work activities are followed

2.2 Relevant gas regulator and code of practice recording and reporting requirements are undertaken at appropriate times throughout the work sequence

2.3 Gas and electrical circuits/machines/plant are isolated in accordance WHS/OHS requirements and workplace procedures

2.4 Stationary gas fuelled turbine engine components, fuel train and associated pipe-work and flue/exhaust systems are installed in accordance with design specification, industry technical standards and regulatory requirements, with sufficient access to affect terminations, adjustment and maintenance

2.5 Ventilation systems are installed in accordance with design specification

2.6 Electrical components, wiring enclosures and wiring terminations are installed in accordance with design and manufacturer specifications, and functional and regulatory requirements

2.7 Compliance and safety inspections of installed turbine engine, equipment, pipe-work, components and accessories are undertaken and defects are rectified

2.8 Installation is carried out efficiently without unnecessary waste of materials or damage to plant, equipment, pipe-work, components, accessories and the surrounding environment or services using sustainable energy principles

2.9 Unplanned situations are responded to in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment safely and with the approval of an authorised person

- 3 Commission stationary gas fuelled turbine engine**
- 3.1** WHS/OHS risk control measures and workplace procedures for carrying out work activities are followed
 - 3.2** Relevant gas regulator and code of practice recording and reporting requirements are satisfied at appropriate times throughout the work sequence
 - 3.3** Gas and electrical safety checks and isolation workplace procedures and purging are completed and recorded to manufacturer and relevant authority requirements before testing and commissioning are commenced
 - 3.4** Operational parameters of individual components are tested and adjusted to conform with specifications
 - 3.5** Turbine engine operations are tested, first without and then with fuel, adjustments are completed, as necessary, and results recorded in accordance with approving authority requirements
 - 3.6** Exhaust gases are analysed in accordance with relevant industry practice and authority requirements
 - 3.7** Unplanned situations are responded to in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment safely and with the approval of an authorised person
 - 3.8** Commissioning is conducted without waste of materials or damage to apparatus and the surrounding environment or services using sustainable energy practices
- 4 Complete and report installation and commissioning activities**
- 4.1** WHS/OHS work completion risk control measures and workplace procedures are followed
 - 4.2** Final check of the installed gas fuelled turbine engine is made to verify compliance with job requirements, certification required by relevant gas authorities and industry standards
 - 4.3** Work area is cleared and materials disposed of or recycled in accordance with relevant legislation and workplace procedures
 - 4.4** Tools and equipment are cleaned, checked, serviced and stored in accordance with manufacturer recommendations and workplace procedures

- 4.5 Work site is cleaned and made safe in accordance with workplace procedures
- 4.6 'As-installed' gas fuelled turbine engine equipment, components, pipe-work, flue/exhaust systems and accessories are documented, accessed and appropriate person/s notified in accordance with 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.

gas fuels must be from one (1) the following:

- gas gathering lines
- gas transmission pipelines
- distribution pipeline
- consumer gas installations

gas fuels must include one (1) the following:

- natural gas
- liquified petroleum gas (LPG)
- synthetic natural gas (SNG)
- bio-gas
- waste gas or sewage gas

used as a single gas fuel or part of a dual fuel system

Unit Mapping Information

This unit replaces and is equivalent to UEGNSG138 Install and commission stationary gas fuelled turbine engines.

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 UEGNSG103 Install and commission stationary gas fuelled turbine engines

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, performance criteria and range of conditions on at least two separate occasions and include:

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - applying workplace procedures and practices
 - using risk control measures
- applying sustainable energy principles and practices
- commissioning gas fuelled turbine engine plant and equipment operation, as necessary, and recording results in accordance with approving authority requirements
- conducting pressure testing, repairing leaks and purging the fuel train system entire system to the appropriate design test pressures
- dealing effectively with unplanned events in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment
- documenting 'as-installed' gas fuelled turbine engine plant, equipment, pipe-work, components and accessories
- installing, securing, aligning and connecting plant, equipment, pipe-work, components and accessories accurately in their planned location and in compliance with codes of practice and relevant industry standards
- obtaining formal authority to proceed with gas fuelled turbine engine installation and commissioning before commencing work, in accordance with regulatory and code of practice requirements
- reading and interpreting documents related to gas fuelled turbine engine plant/equipment, locations and pipe-work connections
- rectifying any defects revealed through on-going inspections
- undertaking on-going gas fuelled turbine engine compliance and safety inspections.

Knowledge Evidence

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

- commissioning, including:
 - inspection of the installed turbine engines, pipe-work, components and accessories
 - testing turbine engine operation first without and then with fuel
 - testing and adjusting regulator, operation and safety controls
 - exhaust gases analysis throughout operating parameters, including bi-fuel applications
 - compliance with design specification, regulations, codes, standards and manufacturers specifications
- authority to proceed, including regulatory requirements (scope and restrictions), relevant industry standards and codes of practice
- design specifications
- exhaust/flue requirements, including materials and terminations
- fuel train requirements, including pipe-work and connections, valves, metering devices, regulating valves and electrical controls
- gas fuel types, properties and applications
- gas fuelled turbine engine overview, including types, major components, operating principles, manufacture specifications and diagrams
- installation and commissioning techniques for stationary gas fuelled turbine engine up to a capacity of 500 kW or speeds of 3600 RPM, including:
 - turbine engines plant and equipment
 - gas train pipe-work and components
 - exhaust/flue system
 - ventilation system
 - pressure testing and purging
 - authorisations and certification requirements and procedures
- location ventilation requirements
- relevant job safety assessments or risk mitigation processes, including:
 - hazardous area requirements
 - safe working practices
 - site safety
- relevant manufacturer specifications
- relevant WHS/OHS legislated requirements
- relevant workplace documentation and reports including ‘as-installed’ turbine engine components, pipe-work, flue/exhaust systems and accessories
- relevant workplace policies and procedures
- site arrangements, location and environment.

Assessment Conditions

As a minimum, assessors must satisfy applicable regulatory requirements, which include requirements in the Standards for Registered Training Organisations current at the time of assessment.

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requirements in the Standards for Registered Training Organisations current at the time of assessment.

Assessment must occur in suitable workplace operational situations where it is appropriate to do so; where this is not appropriate, assessment must occur in suitable 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, facilities, equipment and personal protective equipment (PPE) currently used in industry
- resources used should reflect current industry practices in relation to stationary gas fuelled turbine engines
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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