



Australian Government

UEGNSG139 Repair and maintain stationary gas fuelled turbine engines

Release: 1

UEGNSG139 Repair and maintain 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 isolate, disconnect, repair, reconnect and maintain stationary gas fuelled turbine engines up to a capacity of 5 gigajoule per hour (GJ/hr) (1,300 kilowatt).

It includes disconnecting, carrying out repairs and replacing fuel train components to stationary gas fuelled turbine engine. Reconnecting the gas fuelled turbine engine includes pre-start tests, start up, adjusting components and controls to safe and efficient operation, and completing all required documentation.

This unit does not cover:

- repairs to the internal mechanical components of the engine
- modifications to gas fuelled turbine engine.

Note: 500 kw equates to a gas input of approximately 6 GJ/hr.

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.

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

Pre-requisite Unit

Not applicable.

Competency Field

Cross Discipline Units

Unit Sector

Gas Industry

Elements and Performance Criteria

ELEMENTS

Elements describe the essential outcomes.

1 Prepare to repair and maintain gas fuelled turbine engine

PERFORMANCE CRITERIA

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

- 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** Formal authority to proceed with repair and maintenance is obtained before commencing work in accordance with regulatory and code of practice requirements
- 1.5** Repair and maintenance plans are prepared in consultation with person/s affected by work activity and sequenced appropriately
- 1.6** Scope, nature and location of work activity is determined from documentation or relevant person/s
- 1.7** Gas fuelled turbine engine plant, equipment and component specifications and manufacturer manuals are obtained for planned work activity
- 1.8** Material needed for the gas fuelled turbine engine repair and maintenance work is obtained in accordance with workplace procedures and checked against job requirements
- 1.9** Tools, equipment, personal protective equipment (PPE) and testing devices needed to for the repair and maintenance work are obtained in accordance with workplace procedures and checked for correct operation and safety
- 1.10** Preparatory work is checked to ensure no damage has occurred and complies with job requirements

2 Repair and maintain 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 regulatory and codes of practice, and recording and reporting requirements are satisfied at appropriate times throughout the work sequence
- 2.3** Gas and electrical circuits/machines/plant are isolated and safe in accordance with authority, WHS/OHS requirements and workplace procedures before work is commenced
- 2.4** Nature and possible cause of faults or out-of-specification performance are identified from defect reports or operational records
- 2.5** Fault-finding gas fuelled turbine engine is approached methodically using observation, measurement, calculations and comparison with normal system and component parameters/values
- 2.6** Faults beyond the scope of gas fuel train, ignition or fume exhaust work are identified and arrangements are made for appropriately competent and authorised person to rectify fault/s
- 2.7** Engine is disconnected to carry out maintenance and repairs, as required, in accordance with gas authority and WHS/OHS requirements and workplace procedures
- 2.8** Components are removed/dismantled and parts stored to protect them against loss or damage, as required
- 2.9** Faulty components are rechecked and their fault status confirmed
- 2.10** Gas fuelled turbine engine materials required to rectify faults are sourced and obtained in accordance with workplace procedures
- 2.11** Repair and maintenance work is carried out efficiently, without unnecessary waste of materials or damage to apparatus, circuits, and the surrounding environment or services using sustainable energy principles
- 2.12** Effectiveness of the repair is inspected and tested in accordance with workplace procedures
- 2.13** System is reassembled, reconnected and finally

inspected and tested to ensure it is operating safely, effectively and complies with relevant industry standards and job requirements

2.14 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 Complete and report repair and maintenance

3.1 WHS/OHS work completion risk control measures and workplace procedures are followed

3.2 Check of the gas fuelled turbine engine is made to verify compliance with job requirements, certification required by relevant gas authorities and industry standards

3.3 Work area is cleared and materials disposed of or recycled in accordance with relevant legislation and workplace procedures

3.4 Tools and equipment are cleaned, checked, serviced and stored in accordance with manufacturer recommendations and workplace procedures

3.5 Work site is cleaned and made safe in accordance with workplace procedures

3.6 Maintenance and repair work is documented 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 Companion Volume Implementation Guide.

repairing and maintaining stationary gas fuelled turbine engine up to a capacity of 5 GJ/hr (1300kw), must include each of the following:

- gas fuel train pipe-work, regulators, valves, metering and protective devices from gas pipeline to the engine.
- flue/exhaust system

repairing and maintaining of stationary gas fuelled turbine engine must not include the following:

- pressure testing and purging gas fuel train
- disconnecting and reconnecting gas fuelled turbine engines, and adjusting components and controls to safe and efficient operation
- repairs to the internal mechanical components of the engine
- modifications to gas fuelled turbine engine

gas fuels must include one (1) of 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 UEGNSG139A Repair and maintain 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 UEGNSG139 Repair and maintain stationary gas fuelled turbine engines

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Performance Evidence

- applying relevant work health and safety (WHS)/occupational health and safety (OHS) requirements, including:
 - applying workplace procedures and practices
 - using of risk control measures
- applying sustainable energy principles and practices
- documenting and reporting ‘as-installed’ plant and equipment components, pipe-work, flue/exhaust systems and accessories
- dealing effectively with unplanned events in accordance with workplace procedures, in a manner that minimises risk to personnel and equipment
- repairing and maintaining gas fuelled turbine engines up to a capacity of 5 gigajoule per hour (GJ/hr) (1,300 kilowatt), including:
 - disconnecting engine
 - conducting maintenance
 - finding faults
 - rectifying faults without damage
 - reconnecting
 - providing written reports on work undertaken.

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:

- authority to proceed requirements, including:
 - regulatory requirements (scope and restrictions)
 - relevant industry standards and codes of practice
 - required documentation and submissions
- compliance requirements, including design specification, regulations, codes of practice, industry standards and manufacturer specifications back to commissioned settings

- disconnect requirements, workplace procedures and manufacturers specifications
- exhaust/flue requirements
- fault-finding techniques including:
 - taking readings and gathering information
 - symptoms and possible faults
 - logical fault diagnosis sequence and flow charts
 - manufacturer fault diagnosis tables
 - confirming actual fault
- 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
- location/site ventilation requirements, including environment, piping requirements for gas fuel train pipe-work and suitable equipment/equipment plant locations
- reconnection requirements and workplace procedures, including:
 - manufacturer specifications and procedures
 - inspection of the installed engine, pipe-work, components and accessories
 - pressure testing and purging
 - testing engine operation first without and then with fuel
 - testing and adjusting regulator, operation and safety controls
 - exhaust gases analysis
- relevant stationary gas fuelled turbine engines design manufacturer specifications
- relevant safe work method statements (SWMS)/job safety assessments or risk mitigation processes, including:
 - hazardous area requirements
 - safe working practices
 - site safety
- relevant WHS/OHS legislated requirements
- relevant workplace documentation and reports, including:
 - 'as-installed' plant and equipment components, pipe-work, flue/exhaust systems and accessories
- relevant workplace policies and procedures
- repair and maintenance gas fuelled turbine engines up to a capacity 5 GJ/hr (1,300 kilowatt) requirements, including:
 - gas train pipe-work and components
 - exhaust/flue system
 - ventilation system
 - oil change
 - oil and air filter replacement.

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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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 (PPE) equipment currently used in industry
- resources used should reflect current industry practices for repair and maintenance of stationary gas fuelled turbine engines
- applicable documentation, including workplace procedures, equipment specifications, regulations, codes of practice and operation manuals.

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