



Australian Government

UEGNSG044 Repair and maintain stationary gas fuelled turbine engines

Release: 1

UEGNSG044 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 licensing requirements which must be confirmed prior to commencing this unit.

Pre-requisite Unit

Not applicable.

Competency Field

Gas Cross Discipline

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** Workplace safety, environmental and sustainable energy practices for the site are identified, obtained and understood
- 1.2** Job requirements are obtained and interpreted from plans, specifications and instructions
- 1.3** Relevant job requirements and workplace procedures for work activities are discussed with relevant person/s, including third parties, to determine and confirm work schedule and respective responsibilities
- 1.4** Hazards are identified, workplace safety and environmental risks are assessed, and control measures are prioritised, implemented and monitored in accordance with workplace procedures
- 1.5** Scope of responsibility under the relevant job requirements, including all work permits and/or relevant notifications, is determined and confirmed to access the services and perform work in accordance with job requirements and workplace procedures
- 1.6** Equipment, tools and personal protective equipment (PPE) needed to carry out work activities are identified, obtained and checked for correct operation and safety in accordance with workplace procedures and manufacturer instructions
- 1.7** Materials, plans, diagrams, drawings and resources required for work are confirmed and obtained in accordance with workplace procedures

2 Repair and maintain gas fuelled turbine engine

- 2.1** Workplace safety and environmental risk control measures, schedule of work and workplace procedures for carrying out work 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, workplace safety

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 Faults and operational conditions of the components are identified, repaired or replaced, and reported in accordance with organisational job requirements
- 2.6 Engine is disconnected to carry out maintenance and repairs, as required, in accordance with gas authority and workplace safety requirements and workplace procedures
- 2.7 Components are removed/dismantled, and parts stored to protect them against loss or damage, as required
- 2.8 Faulty components are rechecked, and their fault status confirmed
- 2.9 Gas fuelled turbine engine materials required to rectify faults are sourced and obtained in accordance with workplace procedures
- 2.10 Work is coordinated to ensure completion in agreed timeframe and to industry standards with a minimum of waste in accordance with job requirements and workplace procedures
- 2.11 Effectiveness of the repair is inspected and tested in accordance with workplace procedures
- 2.12 Quality and safety checks of the work are conducted in accordance with job requirements, workplace procedures and community and industry standards
- 2.13 Unplanned events and non-routine problems are identified and actioned in accordance with workplace procedures

3 Complete and report repair and maintenance

- 3.1 Workplace safety 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 Incidents and injuries are reported and followed up as required in accordance with workplace procedures
- 3.4 Tools and equipment are cleaned, checked, serviced and stored in accordance with manufacturer recommendations and workplace procedures
- 3.5 Worksite is cleaned/tidied and made safe in accordance with workplace procedures
- 3.6 Work completion documentation is completed accurately and provided to relevant person/s 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.

Unit Mapping Information

This unit replaces and is equivalent to UEGNSG139 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 UEGNSG044 Repair and maintain 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 and performance criteria on at least two separate occasions and include:

- applying relevant workplace safety 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, pipework, 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 and performance criteria 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 specifications, regulations, codes of practice, industry standards and manufacturer specifications back to commissioned settings

- disconnect requirements, workplace procedures and manufacturer 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 pipework 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, manufacturer specifications and diagrams
- location/site ventilation requirements, including environment, piping requirements for gas fuel train pipework and suitable equipment/equipment plant locations
- reconnection requirements and workplace procedures, including:
 - manufacturer specifications and procedures
 - inspection of the installed engine, pipework, 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 analysis (JSA) or risk mitigation processes, including:
 - hazardous area requirements
 - safe working practices
 - site safety
- relevant workplace documentation and reports, including:
 - 'as-installed' plant and equipment components, pipework, flue/exhaust systems and accessories
- relevant workplace policies and procedures
- relevant workplace safety requirements, including:
 - legislated work health and safety (WHS)/occupational health and safety (OHS) requirements
 - legislated industry/technical specific requirements
 - workplace safety procedures
 - manufacturer requirements
- repair and maintenance gas fuelled turbine engines up to a capacity 5 GJ/hr (1,300 kilowatt) requirements, including:
 - gas train pipework 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 that 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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