



Australian Government

UEGNSG806A Maintain SCADA controlled flow and pressure equipment and electronic gas measurement equipment

Release 1

UEGNSG806A Maintain SCADA controlled flow and pressure equipment and electronic gas measurement equipment

Modification History

Not applicable.

Unit Descriptor

Unit Descriptor 1) Scope:

1.1) Descriptor

This unit covers the monitoring, operating and maintaining Supervisory Control and Data Acquisition System (SCADA) controlled gas distribution and transmission station facilities in accordance with relevant legislation, codes, regulations and procedures.

It encompasses Gas Station monitoring, operation and maintenance of equipment which includes remotely operated and controlled valves, air loaded & SCADA controlled regulators, Coriolis, Ultrasonic and electronic meters.

Application of the Unit

Application of the Unit 2)

This competency standard shall apply to the following types of gas stations, subject to all Workplace Health and Safety (WHS) / Occupational Health and Safety and duty of care requirements being met for the workplace:

- Compressor stations
- Custody transfer stations
- Inlets and city gates
- Scraper stations
- Gas storage facilities
- SCADA controlled Main Line Valves

This unit is intended as an AQF 4 competency for

existing workers in the gas industry. It is suitable for employment-based programs under an approved contract of training.

Licensing/Regulatory Information

License to practice

3)

During Training:

Competency development activities are subject to regulations directly related to licensing, occupational health and safety and where applicable contracts of training such as apprenticeships.

In the workplace:

The application of the skills and knowledge described in this unit require a license to practice in the workplace where work is carried out on electrical equipment or installations which are designed to operate at voltages greater than 50 V a.c. or 120 V d.c.

The skills and knowledge described in this unit are also subject to licence regulation directly related to Workplace Health and Safety, Occupational Health and Safety, gas/electricity/water industry safety and compliance, industrial relations, environmental protection, telecommunications, anti-discrimination and training.

Note:

Other conditions may apply under State and Territory legislative and regulatory requirements, for example:

1. Compliance with permits may be required in various jurisdictions and typically relates to the operation of plant, machinery and equipment such as elevating work platforms, powder operated fixing tools, power operated tools, vehicles, road signage and traffic control, lifting equipment.

Permits may also be required for some work environments such as hazardous areas, confined spaces, working aloft, near live electrical devices, site rehabilitation.

2. Compliance may be required in various jurisdictions relating to currency in First Aid, hazardous areas, confined space, lifting and risk safety measures

Commonwealth, State/Territory or Local Government legislation and regulations may exist that limits the age at which persons can operate certain equipment.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

Granting of competency in this unit shall be made only after competency in the following unit(s) has/have been confirmed:

- UEGNSG005A Prepare to work in the Australian gas industry
- UEGNSG006A Use a portable gas detectors to locate escape
- UEGNSG132A Carry out basic work activities in a gas industry work environment
- UEGNSG134A Establish a utilities infrastructure work site
- UEGNSG140A Apply environmental policies and procedures in the utilities industry
- UEGNSG141A Apply Workplace Health and Safety regulations, codes and practices in the gas industry
- UEGNSG804A Maintain Single Stage and Single Run Gas Flow and Pressure Control and Measuring Devices
- UEGNSG805A Maintain Multi-Stage and Multi-Run Gas Flow and Pressure Measuring and Regulating Devices

Literacy and numeracy skills 4.2)

Participants are best equipped to achieve this unit if they have reading, writing and numeracy skills indicated by the following scales. Description of each scale is given in Volume 2, Part 3 'Literacy and Numeracy'

Reading 3 Writing 3 Numeracy 3

Employability Skills Information

Employability Skills

5)

This unit contains Employability Skills

The required outcomes described in this unit of competency contain applicable facets of Employability Skills. The Employability Skills Summary of the qualification in which this unit of competency is packaged will assist in identifying Employability Skill requirements.

Elements and Performance Criteria Pre-Content

6) Elements describe the essential outcomes of a competency standard unit

Performance Criteria describe the required performance needed to demonstrate achievement of the element. Assessment of performance is to be consistent with the Evidence Guide.

Elements and Performance Criteria

ELEMENT

PERFORMANCE CRITERIA

1 Prepare to maintain SCADA controlled gas flow and pressure equipment & electronic gas measurement equipment

- | | |
|-----|--|
| 1.1 | WHS/OHS and environmental measures for the site are identified, obtained and understood. |
| 1.2 | Work requirements for the work are interpreted from plans, specifications and instructions |
| 1.3 | Relevant requirements and established procedures for the work are discussed with relevant persons to establish and confirm the work schedule and respective responsibilities |
| 1.4 | WHS/OHS, environmental and sustainable energy policies and procedures are received and confirmed. |
| 1.5 | Hazards are identified, WHS/OHS and risks are assessed and control measures are prioritised, implemented and monitored according to established procedures. |
| 1.6 | Scope of the responsibility under the relevant work permits and/or relevant notification is received and confirmed are obtained to access, isolate/de-energise |

ELEMENT	PERFORMANCE CRITERIA
	systems and perform work according to requirements and established procedures
	1.7 Equipment, tools and personal protective equipment needed to carry out the work are identified, scheduled, obtained and checked for correct operation and safety.
	1.8 Appropriate persons are consulted to ensure the work is coordinated effectively with others involved
	1.9 Materials, plans, diagrams, drawings and resources required for work are confirmed, scheduled and obtained in accordance with established procedures
	1.10 Relevant responsibilities associated with first aid and other related work safety procedures for an incident at the worksite are checked and confirmed.
	1.11 Third party issues are referred to appropriate persons in accordance with established procedures, for example "low voltage electrical work".
	1.12 Site preparation, safety plan and the work schedule are confirmed in accordance with established procedures.
2 Maintain SCADA controlled gas flow and pressure equipment & electronic gas measurement equipment	2.1 WHS/OHS risk control measures, schedule of work and standard operating procedures for carrying out the work are followed.
	2.2 Gas detectors are used to determine if gas concentration in worksite is safe and to locate and pinpoint any gas escapes and immediate supervisor is advised immediately if site is unsafe.
	2.3 Appropriate materials, tools, equipment and measuring devices are selected and used correctly and safely.
	2.4 Hazardous activities such as lifting, climbing, working in confined spaces, excavations, trenches, or aloft, and use of power tools, techniques and practices are conducted safely in accordance with given instructions and to requirements
	2.5 Work is carried out efficiently, to the required standard without waste of materials or damage to apparatus, circuits, the surrounding environment or

ELEMENT

PERFORMANCE CRITERIA

		services and using sustainable energy principles.
	2.6	Hazard warnings and safety signs are recognised and assessed WHS/OHS risks and incidents are reported to the immediate authorised persons for directions according to established procedures
	2.7	Electrical isolations are scheduled, local/remote control actuated and communicated as per established company procedures
	2.8	Data on system performance, usage and unplanned events are collected, reviewed and reported in accordance with established procedures
	2.9	Gas station venting and purging operations are undertaken with established company procedures
	2.10	Regulator and meter runs and components are setup and operated, system is vented, purged and pressurised in accordance with established company procedures
	2.11	Process variables and set points are taken and required adjustments and repairs are carried out in accordance with established procedures
	2.12	Actuators are isolated/ de-energised in accordance with manufactures instructions and established company procedures
	2.13	Procedures for referring non-routine events to the immediate authorised persons for directions are followed.
	2.14	Routine quality checks are carried out in accordance with work instructions
3 Complete the work and relevant documentation	3.1	WHS/OHS risk control work completion measures and procedures are followed.
	3.2	Work site is tidied and made safe in accordance with established procedures
	3.3	Tools, equipment and any surplus resources and materials are cleaned, checked and securely stored.

ELEMENT

PERFORMANCE CRITERIA

- 3.4 Appropriate persons are notified of work completion according to established procedures
- 3.5 Work completion documentation is completed accurately and provided to appropriate persons in accordance with established procedures.

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

7) This describes the required skills and knowledge and their level for this unit.

Evidence shall show that knowledge has been acquired of safe working practices for carrying out work in a gas industry environment.

All knowledge and skills detailed in this unit should be contextualised to current industry practices and technologies. The extent of the required skills and knowledge is provided below. It forms an integral part of this unit.

KS01-G806A Electronic (SCADA) Gas Flow, Pressure Control & Measurement

Evidence shall show an understanding of operating and maintaining Supervisory Control and Data Acquisition System (SCADA) gas flow and pressure measuring and regulating devices in accordance with relevant legislation, standards, codes and established procedures to an extent indicated by the following aspects:

T1. Principles of SCADA use in monitoring and control of applicable organisational gas infrastructure

T2. Component types, function and operation including:

- data collection and equipment control functions including:
 - Remote Terminal Unit (RTU)
 - Plant Control System (PCS) what's this mean?
 - PLC's Programmable Logic Controllers
 - DCS's Distributive Control Systems
- system controller interface such as Human Machine Interface (HMI)
- data and voice communication including:
 - Satellite Link
 - Internet Protocol (IP)
 - Modem/ISDN
 - UHF/VHF Radio
 - Microwave
 - Local Area Network (LAN)
 - Wide Area Network (WAN)

T3. Remote Telemetry Units (RTU's) and associated controller maintenance including:

- start up and shut down of process controllers and RTU equipment
- adjustment of process set point control and status e.g. local/remote and auto/manual
- alarm monitoring, acknowledgement, prioritisation and escalation
- alarm inhibit/enablement/disablement.

T4. SCADA operated gas conditioning and monitoring equipment

- principles of operation
- components
- maintenance
- fault finding, repair and replacement

T5. SCADA operated pressure control equipment

- types
 - Air loaded diaphragm and sleeve regulators
 - SCADA operated valves
 - ALBs
- principles of operation
- maintenance
- fault finding, repair and replacement

T6. SCADA gas flow measurement equipment

- types
 - Coriolis meters
 - Ultrasonic meters
 - Turbine meters
- operation
- maintenance
- fault finding, repair and replacement

T7. SCADA gas station alarms and safety devices

- types
- operation
- maintenance
- fault finding, repair and replacement

T8. SCADA operated gas station valves

- types
- operation
- maintenance
- fault finding, repair and replacement

T9. SCADA controlled gas station venting, purging and pressurisation operations

T10. Gas station maintenance requirements and procedures

- change over regulator and meter runs
- change over filters/separators
- purge and pressurise station
- adjust set points

T11. Manufacturers specifications, manuals and procedures.

T12. Organisations gas facility manuals, schematics, SCADA displays, switches, P+ID's and procedures

T13. Relevant Legislation, Standards, Codes and Regulations including:

- AS2885.3 Pipelines - Gas and liquid petroleum
- AS/NZS 4645 Gas distribution networks
- AS/NZS 5601 Gas installations

T14. Reporting and documentation requirements

Evidence Guide

EVIDENCE GUIDE

8) The Evidence Guide forms an integral part of this Unit and shall be used in conjunction with all components parts of this unit and performed in accordance with the Assessment Guidelines of this Training Package.

Overview of Assessment 8.1)

Longitudinal competency development approaches to assessment, such as Profiling, require data to be reliably gathered in a form that can be consistently interpreted over time. This approach is best utilised in Apprenticeship programs and reduces assessment intervention. It is the Industry's preferred model for apprenticeships. However, where summative (or final) assessment is used it is to include the application of the competency in the normal work environment or, at a minimum, the application of the competency in a realistically simulated work environment. It is recognised that, in some circumstances, assessment in part or full can occur outside the workplace. However, it must be in accord with Industry and Regulatory policy in this regard.

Methods chosen for a particular assessment will be influenced by various factors. These include the extent of the assessment, the most effective locations for the assessment activities to take place, access to physical resources, additional safety measures that may be required and the critical nature of the competencies being assessed.

The critical safety nature of working with electricity, electrical equipment, gas or any other hazardous substance/material carries

risk in deeming a person competent. Hence, sources of evidence need to be 'rich' in nature so as to minimise error in judgment.

Activities associated with normal every day work have a bearing on the decision as to how much and how detailed the data gathered will contribute to its 'richness'. Some skills are more critical to safety and operational requirements while the same skills may be more or less frequently practiced. These points are raised for the assessors to consider when choosing an assessment method and developing assessment instruments. Sample instruments are included for Assessors in the Assessment Guidelines of this Training Package.

**Critical aspects 8.2)
of evidence
required to
demonstrate
competency in
this unit**

Before the critical aspects of evidence are considered all prerequisites shall be met.

Evidence for competence in this unit shall be considered holistically. Each element and associated Performance Criteria shall be demonstrated on at least two occasions in accordance with the "Assessment Guidelines — UEG11". Evidence shall also comprise:

- A representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to:
 - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the Performance Criteria and range
 - Apply sustainable energy principles and practices as specified in the Performance Criteria and range
 - Demonstrate an understanding of the required skills and knowledge as described in this unit to such an extent that the learner's performance outcome is reported in accordance with the preferred approach; namely a percentile graded result, where required by the regulated environment
 - Demonstrate an appropriate level of employability skills
 - Conduct work observing the relevant Anti-Discrimination legislation, regulations, policies and workplace procedures
- Demonstrate performance across a representative range of contexts from the prescribed items below.
 - Maintaining SCADA controlled gas flow and pressure measuring and regulating devices in accordance with relevant legislation, code, regulations and procedures as described in 9.) Range Statement and including:
 - A. Identifying and interpreting correctly drawings, diagrams, schedules, procedures and manuals relevant to the work to be undertaken.
 - B. Selecting correct materials, equipment, tools, personal protection equipment and measurement devices
 - C. Replacing, operating, fault finding, adjusting and maintaining gas valves, filters, regulators and pressure relief devices
 - D. Replacing, operating, fault finding, adjusting/testing, and maintaining pressure measurement, control, boosters and relief devices
 - E. Purging and venting components
 - F. Completing required documentation and reporting.

- G. Dealing with unplanned events by drawing on essential knowledge and skills, procedures/ protocols to provide appropriate solutions incorporated in the holistic assessment with the above listed items, for example encroachment and/or contact with assets

**Context of and 8.3)
specific
resources for
assessment**

This unit should be assessed as it relates to normal work practice using procedures, information and resources typical of a workplace. This should include:

- WHS/OHS policy and work procedures and instructions.
- Suitable work environment, facilities, equipment and materials to undertake actual work as prescribed by this Competency Standard Unit.
- Appropriate environmental regulation and work practices.
- Appropriate organisational requirements.

These should be part of the formal learning/assessment environment.

Assessment of this competency must also be undertaken in either an actual workplace or under a simulated work environment. Assessment must also integrate the employability skills.

Note:

Where simulation is considered a suitable strategy for assessment, conditions must be authentic and as far as possible reproduce and replicate the workplace and be consistent with the approved industry simulation policy.

The resources used for assessment should reflect current industry practices in relation to locating, proving and protecting utility assets.

Method of assessment **8.4)**

This Competency Standard Unit shall be assessed by methods given in Volume 1, Part 3 "Assessment Guidelines".

Note: Competent performance with inherent safe working practices is expected in the Industry to which this Competency Standard Unit applies. This requires that the required Skills and Knowledge are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and associated skills described in this unit.

Concurrent assessment and relationship with other units **8.5)**

There are no recommended concurrent assessments with this unit, however in some cases efficiencies may be gained in terms of learning and assessment effort being concurrently managed with allied competency standard units where listed.

UEGNSG132A	Carry out basic work activities in a gas industry work environment
UEGNSG140A	Apply environmental policies and procedures in the utilities industry
UEGNSG134A	Establish a utilities infrastructure work site
UEGNSG805A	Maintain Multi-Stage and Multi-Run Gas Flow and Pressure Measuring and Regulating Devices
BSBFLM312B	Contribute to team effectiveness
BSBFLM303C	Contribute to effective workplace relationships

Range Statement

RANGE STATEMENT

9) This relates to the competency standard unit as a whole providing the range of contexts and conditions to which the Performance Criteria apply. It allows for different work environments and situations that will affect performance.

This Competency Standard Unit shall be demonstrated in relation to the operation & maintenance of SCADA controlled gas flow, pressure control & electronic gas measurement equipment in gas regulator and compressor stations

The equipment includes the following;

- Remotely operated valves, types: Double block and Bleed
- Remote Telemetry Units (RTU's) and controllers
- Actuators: Pneumatic, Electric and I to P convertors
- Pressure Controllers
- Meters: Coriolis and Ultrasonic

Note: Fault finding is limited to the component level.

The following constants and variables included in the element/Performance Criteria in this unit are fully described in the Definitions Section of this volume and form an integral part of the Range Statement of this unit:

- Monitoring, adjusting and controlling
- Regulation of flow and pressure
- Gas Measurement
- Recording and reporting
- Regulation of the system
- Equipment
- Organisational and statutory requirements

Unit Sector(s)

Gas Industry

Competency Field

Competency Field **11)**

Gas systems operations

