



Australian Government

UEGNSG507A Remotely monitor and operate gas transmission flow and pressure measuring and regulating devices

Release 1

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Modification History

Not applicable.

Unit Descriptor

Unit Descriptor **1) Scope:**

1.1) Descriptor

This unit covers remotely monitoring and operating of complex flow control and pressure measuring and regulating devices to monitor and control gas supply in gas transmission systems in accordance with relevant legislation, code, regulations and procedures.

It encompasses remotely checking and controlling; regulation of flow and pressure; measuring; recording and reporting; regulation of flow and regulation devices; regulation of the system; equipment; organisational and statutory requirements.

Application of the Unit

Application of the Unit **2)**

This competency standard shall apply gas transmission systems, subject to all Workplace Health and Safety (WHS) /Occupational Health and Safety (OHS) and duty of care requirements being met for the workplace.

This unit is intended as an AQF 3 competency for new and 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, workplace health and safety/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 those directly related to 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 of persons who can operate certain equipment.

Pre-Requisites

Prerequisite Unit(s) 4)

Competencies 4.1)

- UEGNSG005A Prepare to work in the gas industry
- UEGNSG132A Carry out basic work activities in a gas industry work environment
- UEGNSG140A Apply environmental policies and procedures in the utilities industry
- UEGNSG141A Apply Workplace Health and Safety regulations, codes and practices in the gas industry
- MSS402061A Use SCADA systems in operations

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 monitor and operate flow control and pressure measuring and regulating devices

- 1.1 Work requirements for monitoring and operating complex flow control, measuring and regulating devices are interpreted from schedules, plans, specifications and instructions
- 1.2 Relevant requirements and established procedures for the work are communicated to all persons
- 1.3 WHS/OHS, environmental and sustainable energy policies and procedures related to the monitoring and operating of complex flow controls are obtained and confirmed
- 1.4 Work is prioritised and sequenced following consultation with others for completion within acceptable timeframes and in accordance with established procedures
- 1.5 WHS/OHS and environmental risk control measures for identified hazards are prioritised, implemented and monitored against the work schedule
- 1.6 Relevant work permits are obtained to access, isolate/de-energise systems as required and perform work according to requirements and established procedures
- 1.7 Liaison and communication issues with authorised persons, authorities, clients and land owners are resolved and activities coordinated to carry out work

ELEMENT

PERFORMANCE CRITERIA

- 1.8 Persons participating in the work, including plant operators and contractors are fully briefed and respective responsibilities confirmed where applicable in accordance with established procedures
- 1.9 Third party issues are referred to appropriate persons in accordance with established procedures, for example "low voltage electrical work"
- 2 Monitor flow control and pressure measuring and regulating devices and system performance**
- 2.1 WHS/OHS and Environmental policies and procedures and safe work practices are followed to eliminate or minimise incidents and hazards
- 2.2 Information on device and equipment performance is collected and reported in accordance with organisational requirements
- 2.3 Dealing with customers are consistent with standard operating procedures and the special needs of customers are identified and considered in targeting client service
- 2.4 Routine checks of system are scheduled and monitored in accordance with the work schedule and established procedures
- 2.5 Hazard warnings and safety signs are recognised and hazards are assessed and WHS/OHS risks are reported to the immediate authorised persons for directions according to established procedures
- 2.6 Data on system performance and usage is collected, analysed and reported and unplanned events in the monitoring and operation of complex flow control are undertaken with the scope of established procedures
- 2.7 Samples are taken in accordance with established procedures and known solutions to a variety of problems are applied
- 2.8 Ongoing checks of quality of the work are undertaken in accordance with given instructions and established procedures

ELEMENT	PERFORMANCE CRITERIA
3 Control and adjust flows and complete records and reports	3.1 Flow and overflow regulating systems are checked and adjustments made to meet demand and customer requirements
	3.2 Incidents and injuries are reported in accordance with established procedures where applicable
	3.3 Flows and diversions are determined to facilitate repair or emergency activities in accordance with organisational requirements
	3.4 Process faults and operational conditions of the system are identified, addressed and reported in accordance with organisational requirements
	3.5 Relevant work permit(s) are signed off accordance with requirements
	3.6 Work completion records, reports and documentation are finalised and processed and appropriate persons notified

Required Skills and Knowledge

REQUIRED SKILLS AND KNOWLEDGE

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

Evidence shall show that knowledge has been acquired of safe working practices monitoring and operating complex flow control, measuring and regulating devices on gas transmission systems.

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-G356A Transmission pipeline flow control and pressure measuring and regulating devices

Evidence shall show an understanding of monitoring and operating flow control and pressure measuring and regulating devices on gas transmission systems in accordance with relevant legislation, code, regulations and procedures. to an extent indicated by the following aspects:

T1. Principles of control systems used 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)
 - PLC's Programmable Logic Controllers
 - DCS's Distributive Control Systems
 - SCADA Supervisory Control and Data Acquisition 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 operation 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. Gas conditioning and monitoring equipment

- principles of operation
- components
- fault finding, adjustments

T5. Pressure control equipment

- types
- principles of operation
- fault finding, adjustments

T6. Gas flow measurement equipment

- types
- operation
- fault finding, adjustments

T7. Gas station alarms and safety devices

- types
- operation
- fault finding, adjustments

T8. Gas station valves

- types
- operation
- maintenance
- fault finding, adjustments

T9. Monitoring, control and trending functions including, but not limited to:

- Start up and shut down of system interfaces
- Adjustment of applicable security status functions to suit requirements
- Alarm monitoring, acknowledgement, prioritisation and escalation
- Alarm inhibit/enablement/disablement
- Changing of applicable alarm parameters as required
- Analysis of trends and abnormal operating conditions
- Creation of trends as applicable
- Filtering of alarm and event logs
- Maintenance and adjustment including:
 - Scanning ranges and properties
 - Control limitations
 - Detailed history retrieval options
 - Auxiliary control functions
 - Dead band adjustment

T10. Basic troubleshooting including, as applicable:

- Server synchronisation and switch to backup
- Shutdown and re-start of system

T11. System data recording and data communication capabilities with third-party software applications such as external databases and spreadsheet programs etc.

T12. Gas station venting, purging and pressurisation operations

T13. Gas station operation requirements and procedures

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

T14. Manufactures specifications, manuals and procedures.

T15. Organisations gas facility manuals, drawings, schematics, displays, switches, P+ID's and procedures

T16. Relevant Legislation, Standards, Codes and Regulations

T17. Consultations appropriate persons to coordinate work and persons

T18. Required documentation, records and reports

Evidence Guide

EVIDENCE GUIDE

8) The Evidence Guide forms an integral part of this Competency Standard 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 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 assessment instruments are included for Assessors in the Assessment Guidelines of this Training Package.

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

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 knowledge and skills 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.
 - Remote monitoring and operating of flow control and pressure measuring and regulating devices for gas pressure and flow control in transmission systems in accordance with relevant legislation, code, regulations and procedures as described in 9.) Range Statement and including:

Range of tools/equipment/procedures/work place		
Group No	The minimum number of items on which skill is to be demonstrated	Item List
A	At least 3	<ul style="list-style-type: none"> • Interpret technical drawings and symbols • Selection of appropriate tools and equipment • System knowledge of Transmission pipelines and stations • Relevant knowledge of

		AS2885 Part 3
B	All	<ul style="list-style-type: none"> • Auxiliary control systems knowledge and understanding • Wide open monitor operation • Monitor Active Regulation • Two stage pressure reduction with monitor override
C	All	<ul style="list-style-type: none"> • RTU control of regulators
D	At least 2	<ul style="list-style-type: none"> • Pressure Controllers, operation, maintenance and understanding • Commissioning/Setting • Troubleshooting • Pressure Boosters adjustments • Knowledge of types/models
E	At least 2	<ul style="list-style-type: none"> • Regulator knowledge and understanding • Sleeve types • Control valves • Pressure reliefs • Diaphragm types • Hydraulic Plug types
F	At least 2	<ul style="list-style-type: none"> • Valve maintenance and operation. • Automatic Line Break Valves operation and maintenance • Configuration of Ball, Plug, Gate, Instrument and Butterfly valves
G	At least 3	<ul style="list-style-type: none"> • Working knowledge of: • Diaphragm meters • Rotary meters • Turbine meters • Ultrasonic meters • Orifice plates • Coriolis meters • Oil changing
H	At least 3	<ul style="list-style-type: none"> • Operational checks • Single run units • Dual run units • City gates or Trunk Receiving

		<p>Stations (TRS)</p> <ul style="list-style-type: none"> • District regulators • Pressure Reliefs
I	At least 3	<ul style="list-style-type: none"> • Maintenance Activities • Single run units • Dual run units • City gates • District Regulators • Pressure Reliefs
J	At least 3	<ul style="list-style-type: none"> • Pressure alterations • Industrial units • City gates • Regulator Stations • Meter stations
K	At least 3	<ul style="list-style-type: none"> • Flaring and Purging • Industrial units • City gates • Regulator Stations • Meter stations
L	At least 3	<ul style="list-style-type: none"> • Overpressure Protection Systems function and operation. • OPSO • Internal pressure relief systems • Pressure relief valves • Slam Shut systems • Valve Actuator and control systems
M	All	<ul style="list-style-type: none"> • Paperwork: • Risk assessments • Time sheets • Completed work records • Notifications and work permits • Log sheets • Service orders
N	At least one occasion	Deal with an unplanned event by drawing on required knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items

Context of and specific resources for assessment 8.3)

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

- 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.

In addition to the resources listed above, in Context of and specific resources for assessment, evidence should show demonstrated competency in the remote monitoring and operating of flow control, pressure, measuring and regulating devices for gas transmission.

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.

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 specified required Knowledge and Skills 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 required knowledge and 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
- UEGNSG133A Comply with environmental policies and procedures in the utilities industry
- MSS402061A Use SCADA systems in operations
- 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 unit shall be demonstrated in relation to the remote monitoring and operating of flow control and pressure measuring and regulating devices for gas pressure and flow control in transmission systems.

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 of plant using control systems such as SCADA
- Checking and controlling
- Regulation of flow and pressure
- Measuring
- Recording and reporting
- Regulation of flow and regulation devices
- Regulation of the system
- Equipment
- Organisational and statutory requirements

Unit Sector(s)

Gas supply industry

Competency Field

Competency Field **10)**

Transmission.