Title	**Maintain, troubleshoot and rectify faults on a complex gas pressure control and metering station**		
Level	**5**	**Credits**	**30**

Purpose	People credited with this unit standard are able to, for a complex gas pressure control and metering station: demonstrate knowledge of documentation, company procedures, hazards and equipment for maintenance, troubleshooting and rectifying faults on a complex gas pressure control and metering station; maintenance and troubleshooting techniques for a complex gas pressure control and metering station; faults and remedial actions for a complex gas pressure control and metering station; and prepare site for maintenance, troubleshooting and rectifying faults on a complex gas pressure control and metering station; perform maintenance on a complex gas pressure control and metering station; troubleshoot and rectify faults on a complex gas pressure control and metering station; recommission and test a complex gas pressure control and metering station; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved
Prerequisite	Unit 19557, *Perform maintenance on a standard gas pressure control and metering station* and Unit 19560, *Troubleshoot and rectify faults on a standard gas pressure control and metering station*, or equivalent knowledge and skills.

Guidance Information

1 This unit standard is intended for but is not limited to assessment by simulation, attestation, and work records. The range statements relate to enterprise specific equipment, procedures, and processes.

2 Evidence presented for assessment against this unit standard must be consistent with safe working practices and be in accordance with applicable manufacturer's specifications, company procedures and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

3 Legislation, regulations and/or industry standards relevant to this unit standard include but are not limited to the current version of:
Health and Safety at Work Act 2015;

Health and Safety in Employment (Pipelines) Regulations 1999;
Gas Act 1992;
Gas (Safety and Measurement) Regulations 2010;
Resource Management Act 1991;
Hazardous Substances and New Organisms Act 1996;
AS/NZS 4645.1:2018 *Gas distribution networks – Network management*;
AS/NZS 4645.2:2018 *Gas distribution networks – Steel pipe systems*;
AS/NZS 4645.3:2018 *Gas distribution networks – Plastics pipe systems;*
AS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance*;
NZS 5259:2015 *Gas measurement;*
and any subsequent amendments and replacements.

4 References
Australian standards (AS) may be found at www.standards.org.au;
Australian/New Zealand standards (AS/NZS) may be found at www.standards.govt.nz;
New Zealand standards (NZS) may be found at www.standards.govt.nz.

5 Any new, amended or replacement Acts, regulations, standards, codes of practice, guidelines, or authority requirements or conditions affecting this unit standard will take precedence for assessment purposes, pending review of this unit standard.

6 Definitions
Company procedures mean the documented methods for performing work activities, and include health and safety, operational, environmental, and quality management requirements. They may refer to legislation, regulations, guidelines, standard operating procedures, manuals, codes of practice, or policy statements.
Complex gas pressure control and metering station includes twin stream, active-monitor and automatic stream selection configurations.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of documentation, company procedures, hazards and equipment for maintenance, troubleshooting and rectifying faults on a complex gas pressure control and metering station.

Performance criteria

1.1 Company procedures and documentation to maintain and repair complex gas pressure control and metering station equipment are located and interpreted.

Range may include – network standard, equipment operating manuals, maintenance procedures, standard operating procedure, safe work procedure, work instruction, job hazard analysis, job risk assessment.

1.2 Documentation and instructions for a specified job are obtained.

Range may include – job card, maintenance history, location drawing, pressure settings, hazard identification, permit, network plans, authorisation, piping and instrumentation drawing.

1.3 Potential environmental and safety hazards and controls to maintain and repair complex gas pressure control and metering station equipment are described.

Range hazards may include – gas release, pneumatic pressure, confined spaces, vehicles and public, electrical, contaminants, ignition source;
controls may include – gas detection equipment, safe access and egress, temporary traffic control, signage, barriers, personal protective equipment, continuity bond, earthing, waste removal and disposal, fire extinguisher;
evidence of four hazards and controls are required.

1.4 Types and function of equipment, components and materials for maintenance, troubleshooting and rectifying faults in a complex gas pressure control and metering station are described.

Range diagnostic test equipment, gas detection, leak detection, calibrated pressure gauge, spare parts, equipment specific tools, lubrication, paint, test gases.

1.5 Potential hazards of incorrect application and operation of equipment and procedures are described.

Range uncontrolled release of gas, supply interruption, damage to equipment, overpressure downstream, upstream impact.

Outcome 2

Demonstrate knowledge of maintenance and troubleshooting techniques for a complex gas pressure control and metering station.

2.1 Maintenance techniques for complex gas pressure control and metering stations are described.

Range routine safety inspection, equipment functional check, equipment overhaul, equipment replacement, parts replacement, diagnostic inspection, non-routine maintenance, legislative requirements.

2.2 Troubleshooting techniques for complex gas pressure control and metering stations are described.

Range equipment functional test, let-by test, lock-up test, leakage test, flow check, pressure settings check.

Outcome 3

Demonstrate knowledge of faults and remedial actions for a complex gas pressure control and metering station.

3.1 Faults and remedial actions for complex gas pressure control and metering station equipment are described.

Range faults include – leakage, high and low outlet pressure, inadequate flow, relief valve passing, valve seat failure, valve operation, blocked filter, seal failure, orifice fault, hunting, freezing, tampering, contaminants;
remedial actions may include – equipment functional tests, equipment settings, equipment overhaul, parts replacement, leakage checks, structural checks, corrosion checks, cleaning, inspection, lubrication, alignment, measurement, calibration.

3.2 Faults and remedial actions for metering equipment are described.

Range faults include – flow interruption, meter not registering, no meter pulse, security seals, contaminants;
remedial actions may include – equipment functional tests, equipment settings, equipment overhaul, parts replacement, leakage checks, cleaning, inspection, lubrication, alignment, measurement, calibration.

3.3 Station faults and remedial actions are described.

Range faults include – leakage, corrosion, enclosure damage, security breach;
remedial actions include – inspection, repair, coating repair, reporting.

Outcome 4

Prepare site for maintenance, troubleshooting and rectifying faults on a complex gas pressure control and metering station.

Performance criteria

4.1 Potential environmental and safety hazards and controls are identified and controlled.

Range hazards may include – gas release, pneumatic pressure, confined spaces, vehicles and public, electrical, contaminants, ignition source;
controls may include – gas detection equipment, safe access and egress, temporary traffic control, signage, barriers, personal protective equipment, continuity bond, earthing, waste removal and disposal, fire extinguisher.

4.2 Equipment and materials are prepared, handled, and positioned as required on the site.

Range may include – tools, gas detection, leak detection, calibrated pressure gauge, spare parts, equipment specific tools, lubrication, paint, test gases, documentation, personal protective equipment.

Outcome 5

Perform maintenance on a complex gas pressure control and metering station.

Performance criteria

5.1 Equipment is used to carry out maintenance of a complex gas pressure control and metering station.

Range may include – equipment functional tests, diagnostic tests, equipment settings, equipment overhaul, parts replacement, leakage checks, structural checks, corrosion checks, cleaning, inspection, lubrication, alignment, measurement, calibration.

Outcome 6

Troubleshoot and rectify faults on a complex gas pressure control and metering station.

Performance criteria

6.1 Troubleshooting and rectifying of faults is carried out on a complex gas pressure control and metering station and ancillary equipment.

Range must include – high and low outlet pressure, relief valve passing; evidence is required of a minimum of five of – leakage, seat failure, blocked filter, inadequate flow, orifice fault, hunting, oscillation, incorrect settings, freezing.

Outcome 7

Recommission and test a complex gas pressure control and metering station.

Performance criteria

7.1 Complex gas pressure control and metering station is purged, recommissioned and tested for leakage and strength.

Range may include – regulator, control valve, slam shut and relief valve pressure settings, pressure and temperature gauges, flow rate, meter bypass, meter reading, filter differential, leakage test.

Outcome 8

Complete reporting and documentation.

Performance criteria

8.1 Records and documents are completed and processed, and information is communicated to internal and external parties as required.

Range may include – completion notice, additional work, serial numbers, meter data, pressure settings, materials used.

Replacement information	This unit standard replaced unit standard 19558 and unit standard 19559.

Planned review date	31 December 2025

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2023
Review	2	27 May 2021	N/A

Consent and Moderation Requirements (CMR) reference	0014

This CMR can be accessed at http://www.nzqa.govt.nz/framework/search/index.do.

Comments on this unit standard

Please contact MITO New Zealand Incorporated info@mito.org.nz if you wish to suggest changes to the content of this unit standard.