Title	**Cut, thread, and join steel pipes in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to, in a gas network: locate and identify equipment and procedures for, and prepare for, cutting, threading, and joining steel pipes; cut, thread, and join steel pipes; reinstate site; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online);
AS/NZS 4645.1:2018 *Gas distribution networks – Network management*;
AS/NZS 4645.2:2018 *Gas distribution networks – Steel pipe systems*;
AS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction;* 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.

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 Definition

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.

Outcomes and performance criteria

Outcome 1

Locate and identify equipment and procedures for, and prepare for, cutting, threading, and joining steel pipes in a gas network.

Performance criteria

1.1 Documentation and company procedures for cutting, threading, and joining steel pipes are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, consents

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – manual handling, oil spill, swarf removal; controls may include –personal protective equipment, environmental protection, handling and lifting techniques.

1.4 Types and function of cutting, threading, and jointing equipment and materials are identified and described.

Range stocks and dies, threading machine, pipe cutters, bonding cable, cutting paste, oil, jointing materials, fittings, pipe reamers, thread type, pipe size, pipe pressure rating, pipe specification.

1.5 Potential faults associated with the incorrect application and operation of equipment, and the steps to avoid them are described.

Range incorrect thread type, incorrect pipe/fitting specification, inadequate joint, coating damage, pipe damage.

1.6 Resource requirements are identified and sourced.

Range tools, materials, personal protective equipment.

Outcome 2

Cut, thread, and join steel pipes.

Performance criteria

2.1 Cutting, threading, and jointing materials and equipment are prepared, handled, and positioned.

2.2 Steel pipes are cut, threaded, and joined.

Outcome 3

Reinstate site.

Performance criteria

3.1 Equipment and materials left temporarily on site are stored safely and securely, or arrangements are made for their collection.

3.2 Tools, equipment, and materials are removed from site.

3.3 Worksite is reinstated and made safe.

Outcome 4

Complete reporting and documentation.

Performance criteria

4.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

4.2 Records and documents are completed and processed.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	25 June 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2018
Review	5	17 August 2017	31 December 2021
Review	6		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.

Title	**Draft information for as-built drawings for a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment for as-built drawings for a gas network; provide the information for as-built drawings; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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 Performance of the outcomes of this unit standard must comply with the following:
Health and Safety at Work Act 2015;
Resource Management Act 1991;
Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online);
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*
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.

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 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation and equipment for as-built drawings for a gas network.

Performance criteria

1.1 Documentation and company procedures for as-built drawings are located and interpreted in relation to specified job requirements.

Range may include – surveys, construction drawing, reports, job cards, reference points, network drawing.

1.2 Job instructions are confirmed.

Range instructions may include – site location, utility plans, new gas asset mark-out, consents, easements.

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – gas escape, other utilities, excavations, animals, vehicles, general public;
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control.

1.4 Types and function of measuring and drawing equipment are identified and described.

Range may include – measuring wheels, measuring tapes, digital measuring equipment- GPS, laser.

1.5 Resource requirements are identified and sourced.

Range tools, materials, personnel, communication equipment, personal protective equipment.

1.6 Offset measurement abbreviations are identified and interpreted according to industry usage.

Outcome 2

Provide the information for as-built drawings.

Performance criteria

2.1 Gas asset features and the surrounding area are identified and recorded.

Range may include – tees, valves, pipe protection, tracer wire, inserted pipe duct size and type, bends, decommissioned line, steel cased crossing, plastic ducts, reducers, flanges, transition sections, end caps, anodes, rectifier, cathodic protection monitoring points, electrical bonding, bridge crossing, section boundaries, house numbers, kerbs, fire hydrants, manhole lids, power poles, squeeze off points, reference points, abbreviations, length, offsets, risers, manifolds, structures; buildings, bridges.

Outcome 3

Complete reporting and documentation.

Performance criteria

3.1 As-built drawings of gas assets show all main features of systems.

Range include – location;
may include – size, type, depth, material, pressure.

3.2 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

3.3 Records and documents are completed and processed.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	23 July 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Rollover and Revision	4	20 November 2006	31 December 2020
Review	5	17 August 2017	31 December 2021
Revision	6	30 August 2018	31 December 2021
Review	7		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.

Title	**Identify community concerns and respond to enquiries relating to gas industry operations and activities**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to, for gas industry operations: identify potential community concerns; and respond to community enquires.

Classification	Gas Industry > Gas Marketing, Business and Administration

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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 the :
Health and Safety at Work Act 2015; and any subsequent amendments and replacements.

4 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.

5 Definition
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.

Outcomes and performance criteria

Outcome 1

Identify potential community concerns in relation to gas industry operations.

Performance criteria

1.1 Individual and company responsibilities for public relations roles are identified.

1.2 The potential impact of company operations on external bodies or individuals is described.

Range operations may include – pipelines, pressure control stations, gate stations, easements, unmanned sites, vents, crossings, meters, regulators, mains, services, excavations, maintenance activity, survey, construction activity, business activity, incidents or emergency situations, new connection, reconnection, disconnections, switching, gas outages.

1.3 Stakeholder roles and requirements are identified in relation to specific operations.

Range may include – customer, contractor, property owner, supplier, shareholder, local business, regional council, iwi, New Zealand Transport Agency, rail network operators, general public, local council, government department, emergency services, other utilities, WorkSafe.

1.4 Potential community concerns relating to company operations are described.

Range concerns may include – odours, pricing, noise, product use, flammable gases, emergencies, safety issues, timing, duration, supply outage, reinstatement, cultural, environmental, restricted access.

Outcome 2

Respond to community enquiries about gas industry operations and activities.

Performance criteria

2.1 Response required to address an enquiry is determined.

2.2 The mode of response is appropriate to the enquiry.

Range may include – oral, written; handwritten, digital.

2.3 The language, register and tone used are appropriate to the situation and the relationship between the participants.

2.4 Information given to address the enquiry is clear and presented in a manner appropriate to the enquirer.

2.5 Feedback is sought from the enquirer to ensure the information is understood.

2.6 Strategies to resolve conflict situations are applied, if required.

2.7 Where necessary, enquires are escalated.

2.8 Follow up actions are completed.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 August 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	23 July 2004	31 December 2018
Review	5	20 November 2006	31 December 2020
Review	6	17 August 2017	31 December 2021
Revision	7	30 August 2018	31 December 2021
Review	8		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.

Title	**Gain approvals and implement notification procedures for works in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of procedures for work notifications and approvals in a gas network; and locate documentation, gain approvals and implement notifications.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Gas Act 1992;
Resource Management Act 1991;
Gas (Safety and Measurement) Regulations 2010;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*
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.

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 Definition
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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of procedures for work notifications and approvals in a gas network.

Performance criteria

1.1 Types of notifications and approvals required for works are described.

Range may include – permit to work, traffic management plan, road opening notice, environmental consent, access approvals, work agreements, regulatory consent, particular hazardous work (WorkSafe).

1.2 Parties affected by works are identified and their specific requirements are outlined.

Range may include – New Zealand Transport Agency, local authority, rail network operators, landowner, iwi, emergency services, other utilities, WorkSafe.

1.3 Methods of notification are described.

Range may include – advertising, telephone, mail, person to person, email, website, site signage, radio, television, forms.

1.4 Notification requirements for different types of disruption caused by works are described.

Range disruptions may include – traffic restrictions, access restrictions, supply interruption, gas release, construction works, noise, dust.

1.5 Conditions of required consents or approvals are described

Range may include – special conditions, unreasonable conditions, appeals, historic approvals.

Outcome 2

Locate documentation, gain approvals and implement notifications.

Performance criteria

2.1 Documentation and company procedures for notifications and approvals are located.

Range may include – permit to work, traffic management plan, road opening notice, environmental consent, access approvals, works agreements, regulatory consents, particular hazardous work (WorkSafe).

2.2 Obtain approvals prior to commencement of work.

Range may include – permit to work, traffic management plan, road opening notice, environmental consent, access approvals, works agreements, regulatory consents, particular hazardous work (WorkSafe).

2.3 Parties are notified of proposed works.

Range may include – advertising, telephone, mail, person to person, email, website, site signage.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 August 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2020
Review	5	17 August 2017	31 December 2021
Revision	6	30 August 2018	31 December 2021
Review	7		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.

Title	**Use pressure gauges and monitoring equipment in a gas network**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to, in a gas network: locate and identify procedures, documentation, and equipment for monitoring pressures; prepare for and use pressure gauges and monitoring equipment; and complete documentation and reporting.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
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 – Plastic 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 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment for monitoring pressures in a gas network.

Performance criteria

1.1 Documentation and company procedures for using pressure monitoring equipment are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions include – site location, asset type, pressure conditions and monitoring duration.

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – gas release, hazardous areas, other utilities, excavations, pressure release, traffic and general public; controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, intrinsically safe equipment, environmental protection.

1.4 Types and function of pressure monitoring equipment, components, and materials are identified and described.

Range types may include – hoses, analogue gauges, digital gauges data loggers;
function may include – absolute pressure, gauge pressure, differential pressure, maximum pressure, minimum pressure.

1.5 Potential errors associated with incorrect application and operation of equipment and procedures, and the steps to avoid them are described.

Range errors may include – incorrect equipment pressure range, equipment out of calibration, incorrect accuracy range, adiabatic effect;
steps may include – equipment calibration, equipment selection, stabilisation, zeroing, allowable tolerances.

1.6 Resource requirements are identified and sourced.

Range may include – equipment,tools, materials, certification or documentation, personnel, communication equipment, personal protective equipment.

Outcome 2

Prepare for and use pressure gauges and monitoring equipment.

Performance criteria

2.1 Pressure gauges and monitoring equipment, and materials are prepared, handled and positioned.

2.2 Monitoring equipment is operated.

Outcome 3

Complete documentation and reporting.

Performance criteria

3.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

3.2 Records and documents are completed and processed.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 November 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2020
Review	5	17 August 2017	31 December 2021
Revision	6	30 August 2018	31 December 2021
Review	7		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.

Title	Use hand-held gas leakage detection equipment in a gas network		
Level	3	Credits	5

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment for using hand-held gas leakage detection equipment; use hand-held gas leakage detection equipment; and interpret and record gas leakage detection equipment readings.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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:
Gas Act 1992;
Health and Safety at Work Act 2015;
Gas (Safety and Measurement) Regulations 2010;
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 – Plastic pipe systems;*
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance*;
and any subsequent amendments and replacements.

4 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.

5 The candidate will be assessed on enterprise-specific hand-held equipment that may include: thermal conductivity detector (e.g. Gasco seeker), flame ionisation detector (FID), laser detection, personal multi-gas detector.

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.
LEL stands for lower explosive limit.
UEL stands for upper explosive limit.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment for using hand-held gas leakage detection equipment.

Performance criteria

1.1 Documentation and company procedures for using gas leakage detection equipment are located and interpreted in terms of general use.

1.2 Types and function of equipment, components, and materials for using gas leakage detection equipment are identified and described.

Range type may include – combustible gas detector, flame ionisation detector, personal multi-gas detector, laser detector;
components may include – pumps, hoses, gauges, water traps, hydrogen cylinders, probes, aspirators, gas scale, batteries, filters, meter scale, multi-gas cylinder;
function may include – 0-10% LEL, 0-100% LEL, 0-100% gas, zero, parts per million.

1.3 Potential hazards associated with using hand-held gas leakage detection equipment and their controls are described.

Range hazards may include – faulty equipment, incorrect readings, hazardous atmosphere;
controls may include – equipment selection, equipment calibration equipment maintenance, training, procedures and manufacturer's instructions.

Outcome 2

Use hand-held gas leakage detection equipment.

Performance criteria

2.1 Gas leakage detection equipment is checked for calibration.

Range may include – calibration label, reference cylinder, tag, certificate, currency.

2.2 Functional checks are completed.

Range may include – detector purged, zero reading, calibration gas used, battery level check, filter check, hose and wand check.

2.3 Gas leakage detection equipment is operated.

Outcome 3

Interpret and record gas leakage detection equipment readings.

Performance criteria

3.1 Readings are interpreted in terms of LEL and UEL.

3.2 Readings are interpreted in terms of parts per million or gas in air.

3.3 Readings are recorded.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 November 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2020
Review	5	17 August 2017	31 December 2021
Revision	6	30 August 2018	31 December 2021
Review	7		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.

Title	**Use fresh air distance breathing apparatus in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation and equipment for using distance breathing apparatus; and use fresh air distance breathing apparatus in a gas network.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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 Performance of the outcomes of this unit standard must comply with the following:
Health and Safety at Work Act 2015;
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 – Plastic 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;*
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.

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 This unit standard covers either fan-assisted or non-fan assisted breathing apparatus.

7 Assessment against this unit standard may take place under real or practical simulated conditions.

8 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment for using fresh air distance breathing apparatus.

Performance criteria

1.1 Documentation and company procedures for using fresh air distance breathing apparatus are located and interpreted in relation to specified job requirements.

1.2 Types and function of distance breathing apparatus, components, and materials are identified and described.

Range may include – full face mask, breathing hose, harness, waist belt, fan unit, vent, filter, ground spike, hose coupler.

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – restricted working, asphyxiation, health hazards, poor communication;
controls may include – personal protective equipment, safety observer, hygiene, safe atmosphere, gas detection, communication equipment.

1.4 Potential faults associated with fresh air breathjng apparatus components are identified prior to use and steps to remedy them are described.

Outcome 2

Use fresh air distance breathing apparatus in a gas network.

Performance criteria

2.1 Fresh air distance breathing apparatus is laid out for use.

2.2 Face mask and visor are cleaned and prepared for use.

2.3 Fresh air distance breathing apparatus is put on.

2.4 Fit and soundness of face mask are tested.

2.5 Soundness of system is checked.

2.6 Fresh air distance breathing apparatus is used.

2.7 Equipment is removed, checked, and cleaned for storage.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 November 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2020
Review	5	17 August 2017	31 December 2021
Revision	6	30 August 2018	31 December 2021

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.

Title	**Test gas for odour level and odorant concentration in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment for testing gas for odour level and odorant concentration; test gas for odour level and odorant concentration; and complete documentation and reporting requirements.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. The range statements relate to site 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: Gas Act 1992;
Hazardous Substances and New Organisms Act 1996;
Health and Safety at Work Act 2015;
Resource Management Act 1991;
Gas (Safety and Measurement) Regulations 2010;
NZS 5263:2003 *Gas detection and odorization*;
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 – Plastic pipe systems;*
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*
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 For the purpose of this unit standard the term ‘gas’ refers to natural gas; liquefied petroleum gas (LPG); tempered liquefied petroleum gas (TLPG), and biogas.

7 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation and equipment for testing gas for odour level and odorant concentration.

Performance criteria

1.1 Documentation and company procedures for testing gas for odour level and odorant concentration are located and interpreted in relation to specified job requirements.

Range manufacturer’s instructions, equipment operating manuals, maintenance procedures, test certificates, calibration labels.

1.2 Potential environmental and safety hazards are identified.

Range hazards may include – gas release, hazardous areas, olfactory, waste;
controls may include – signage, barriers, personal protective equipment, temporary traffic control, intrinsically safe equipment, environmental protection, frequency of tests.

1.3 Types and function of odour level and odorant concentration testing equipment, components, and materials are identified and described.

Range type may include – odorometer, odorator, vacuum pump test tubes, manual or automatic pumps, sample vessel, sample lines and connections;
function – odour level, odorant concentration.

1.4 Potential risks of incorrect application and operation of equipment and procedures, and the steps to avoid them are described.

1.5 Resource requirements are identified and sourced.

Range may include –tools, equipment, materials, documentation, personnel, communication equipment, personal protective equipment.

Outcome 2

Test gas for odour level.

Performance criteria

2.1 Odour level testing equipment is selected for conditions and site application.

2.2 Equipment is operated.

2.3 Safety procedures relating to odour level testing techniques are demonstrated.

Outcome 3

Test gas for odorant concentration.

Performance criteria

3.1 Odorant concentration testing equipment is selected for conditions and site application.

3.2 Equipment is operated.

3.3 Safety procedures relating to odorant testing techniques are demonstrated.

Outcome 4

Complete documentation and reporting requirements.

Performance criteria

4.1 Information about gas odour level and odorant concentration is communicated.

Range may include – special conditions, test results, additional works.

4.2 Records and documents are completed and processed.

Replacement information	This unit standard replaced unit standard 9573.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	26 January 2004	31 December 2018
Rollover and Revision	2	20 November 2006	31 December 2020
Review	3	17 August 2017	31 December 2021
Revision	4	30 August 2018	31 December 2021
Review	5		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.

Title	**Connect, test, and purge mains and services in a gas network**		
Level	**4**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment to perform a pneumatic test, connect and purge a gas main or service; prepare to connect, test, and purge a gas main or service; connect services to a gas main; carry out pneumatic pressure tests on a gas main or service; liven up and purge a gas main or service; reinstate site; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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.

3 Performance of the outcomes of this unit standard must comply with the following:
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 4645.1:2008 *Gas distribution networks – Network management*;
AS/NZS 4645.2:2008 *Gas distribution networks – Steel pipe systems*;
AS/NZS 4645.3:2008 *Gas distribution networks – Plastic pipe systems;*
AS 2885.1-2012 *Pipelines – Gas and liquid petroleum Design and construction.*

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;
British standards (BS) may be found at www.standards.govt.nz;
International Standards Organisation (ISO) standards may be found at www.iso.org.

Gas Industry Protocols (GIP) may be found by contacting the Gas Association of New Zealand www.gasnz.org.nz;
National Association of Corrosion Engineers standards (NACE) may be found at www.nace.org;
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 Pipelines may be polyethylene or steel. This unit standard excludes pigging of pipelines.

7 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment to perform a pneumatic pressure test, connect and purge a gas main or service.

Performance criteria

1.1 Documentation and company procedures for testing, connecting and purging a gas main or service are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, utility plans, mark-outs, consents, easements.

1.3 Potential environmental and safety risks are identified.

1.4 Methods of connecting services and mains to types of gas mains are described.

Range methods may include – electrofusion jointing, mechanical couplings, steel welding;
drill and tap types may include – polyethylene, cast iron, low pressure steel, medium pressure steel, intermediate pressure steel, inserted main.

1.5 Methods of breaking into the casing pipe where there is an inserted gas main are described.

Range may include – wheel cutters, window cutters, cast iron cutters, exploratory drill hole.

1.6 Types and function of pneumatic pressure testing and purging equipment, components, and materials are identified and described.

Range equipment may include – gauge, compressor, test head, leak detection equipment, purge stack, flare stack, gas detection equipment, tools, fittings.

1.7 Potential risks of incorrect application and operation of equipment and procedures, and the steps to avoid them are described.

1.8 Resource requirements are identified and sourced.

Range plant, tools, materials, documentation, system components, personnel, communication equipment, personal protective equipment.

Outcome 2

Prepare to connect, test, and purge a gas main or service.

Performance criteria

2.1 Safety and environmental risks are identified, and controlled.

Range risks may include – gas escape, fire, explosion, asphyxiation, other utilities, excavations;
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, environmental protection.

2.2 Testing, connecting, and purging equipment for specified job is prepared and positioned.

Range may include – gauge, compressor, test head, leak detection equipment, purge stack, flare stack, gas detection equipment, tools, fittings.

2.3 Preparation ensures that pipe work and fittings are anchored in position, pipe systems are isolated, air vents and drainage points are positioned according to design and company requirements.

Outcome 3

Connect a gas service to a gas main.

Performance criteria

3.1 Gas main is prepared for connection, according to type.

Range type may include – polyethylene, cast iron, low pressure steel, medium pressure steel, inserted main.

3.2 Gas service is connected.

Range may include – electrofusion jointing, mechanical couplings, steel welding, drill and tap.

3.3 Carrier pipe is protected from and sealed to casing pipe.

Range anti-shear sleeve, sealing foam, denso/petrolatum tape, polyvinylchloride tape.

Outcome 4

Carry out a pneumatic pressure test on a gas main or service.

Performance criteria

4.1 Pneumatic test pressure is raised, and pressure level and security of pipe system are monitored.

4.2 Test equipment and pipe joints are tested for soundness.

4.3 Stabilisation period is timed.

4.4 Atmospheric pressure reading is obtained.

4.5 Test period is timed, and pressure and time readings are recorded.

Range initial readings, final readings.

4.6 Leaks are traced and repaired, and re-testing is completed.

4.7 On completion of the test, pipe is depressurised in a controlled manner and test equipment is disconnected.

4.8 Record of test is completed.

Outcome 5

Liven up and purge a gas main or service.

Performance criteria

5.1 Gas main or service is livened up.

Range may include – puncture, tap, drill, squeeze off, valve, flow stop.

5.2 Purging equipment is assembled and positioned.

Range may include – purge stack, flare stack, continuity bond, gas detector, fire extinguisher.

5.3 Equipment and pipe are pressurised and checked for soundness.

5.4 Leaks and damaged items are identified, are repaired or replaced, and are reported.

5.5 Purging is carried out.

5.6 Unacceptable pressure conditions are identified and appropriate actions taken.

5.7 Specified gas concentration is achieved at all vent pipes.

5.8 Purging equipment is depressurised and disconnected.

Outcome 6

Reinstate site.

Performance criteria

6.1 Equipment and materials left temporarily on site are stored safely and securely, or arrangements are made for their collection.

6.2 Tools, equipment, and materials are removed from site.

6.3 Worksite is reinstated and made safe.

Outcome 7

Complete reporting and documentation.

Performance criteria

7.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

7.2 Records and documents are completed and processed.

Range may include – job card, test sheets.

Replacement information	This unit standard replaced unit standard 19546 and unit standard 19547.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	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.

Title	**Fit mechanical couplings in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to, in a gas network: locate and identify procedures, documentation, and equipment for fitting mechanical couplings; fit a mechanical coupling; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online);
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.

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 Definition

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.
Mechanical coupling means a compression-type coupling used for joining pipe. It may include a sealing ring and insert.

7 Assessment against this unit standard may take place under real or practical simulated conditions. Assessment must include at least two types of fittings.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment for fitting mechanical couplings in a gas network.

Performance criteria

1.1 Documentation and company procedures for fitting mechanical couplings are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, utility plans, mark-outs, consents, easements.

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – uncontrolled gas escape, excavations, potential energy release, confined working, static electricity, traffic, general public;
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, gas detection, continuity bond, anchoring.

1.4 Types and component parts of mechanical couplings and ancillary equipment and materials are described.

Range types include – bolted compression fittings, screwed compression fittings, crimp fittings;
components may include –inserts, gaskets, wrapping, fitting tools, sealing rings, washers, locking rings, stud bolts.

1.5 Potential faults associated with the incorrect fitting of mechanical couplings, and the steps to avoid them are described.

Range faults may include – mis-alignment, pipe expansion or contraction, incorrect pressure rating, incorrect size range, poor strength, inadequate flexibility, contamination, incorrect tool use.

1.6 Resource requirements are identified and sourced.

Range may include – fittings, tools, materials, documentation, personnel, personal protective equipment.

Outcome 2

Fit a mechanical coupling in a gas network.

Performance criteria

2.1 Couplings and associated fittings are prepared.

2.2 Fitting is selected according to function and application.

Range may include – pipe size and type, pipe pressure, temperature changes, fitting rating, flexibility requirements, expansion, contraction.

2.3 Coupling is fitted.

2.4 Coupling is tested for soundness.

Outcome 3

Complete reporting and documentation.

Performance criteria

3.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

3.2 Records and documents are completed and processed.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	19 June 1997	31 December 2018
Revision	2	3 August 2000	31 December 2018
Review	3	22 October 2002	31 December 2018
Review	4	20 November 2006	31 December 2018
Review	5	21 May 2010	31 December 2020
Review	6	17 August 2017	31 December 2021
Revision	7	30 August 2018	31 December 2021
Review	8		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.

Title	**Lay a polyethylene gas pipeline**		
Level	**3**	**Credits**	**6**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment for laying a gas pipeline; prepare to lay gas pipe; lay gas pipe; and prepare the pipe for reinstatement.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but not limited to, workplace assessment. 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;
Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online);
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 – Plastic pipe systems;*
AS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction;*
AS/NZS 2865:2001 *Safe working in a confined space;*
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.

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 For this unit standard laying a gas pipe excludes site excavation, thrusting, drilling, insertion, testing, connecting, and purging and excludes the jointing of pipe. These are covered in separate unit standards.

7 Definition
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.

8 Range – to meet the requirements of this unit standard, you must lay two PE pipelines; one under 50mm, and one 50mm or over.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment for laying a gas pipeline.

Performance criteria

1.1 Documentation and company procedures for laying a gas pipeline are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, utility plans, mark-outs, consents, easements, drill permit, network drawings.

1.3 Potential environmental and safety hazards are identified, and controlled.

Range hazards may include – manual handling, working in excavations, other utilities, vehicles, general public, coiled pipe releasedrilling mud, pipe strain or damage;
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, pipe trailers/drums, correct lifting techniques, breakaway coupler, waste disposal, pipe inspection.

1.4 Types and function of gas pipe laying equipment, components, and materials are identified and described.

Range may include – pipe, tracer wire, excavation equipment, pipe locator, anti-sheer sleeves, jointing equipment, riser, siphon, temporary lighting, pipe supports, marker tape, breakaway coupler, pipe rollers.

1.5 Potential risks of incorrect application and operation of equipment and procedures, and the steps to avoid them are described.

1.6 Resource requirements are identified and sourced.

Range plant, tools, materials, documentation, personnel, communication equipment, personal protective equipment.

Outcome 2

Prepare to lay gas pipe.

Performance criteria

2.1 Pipe laying equipment is prepared, handled, and positioned.

Range may include – trailers, vehicles, rollers, lifting equipment, drum coils.

2.2 Underground plant is located, exposed, protected and supported to prevent damage.

2.3 Preparation ensures that pipe is protected from damage.

Range free of – obstructions, sharp undulations, sharp bends; protected from – rock, irregular materials, corrosive soils; controls – bedding materials, penetration barriers.

2.4 Trench support system is inspected and confirmed as meeting requirements.

Range: requirements include – worksite safety requirements; *Excavation Safety good practice guidelines;* AS/NZS 2865.

2.5 Pipe is inspected for specification and damage, ends are sealed, and pipe is placed in specified position and supported in prelaying position.

Range may include – colouring, ovality, labelling, wall thickness, rating, defects.

Outcome 3

Lay gas pipe.

Performance criteria

3.1 Mechanical plant and equipment are operated to install gas pipe and tracer wire.

3.2 Pipe and fittings are prepared for laying.

3.3 Pipe is externally inspected.

3.4 Damaged pipe and fittings are marked, removed, quarantined, replaced and are reported.

3.5 Pipe clearance from other plant is maintained other utility operator's requirements.

Outcome 4

Prepare the pipe for reinstatement.

Performance criteria

4.1 Pipeline and tracer wire are checked for positioning.

4.2 Additional pipeline protection is installed.

Range may include – warning tape, mag-slab, rockshield, concrete.

4.3 Documentation is completed.

Range may include – GPS, as-built, inspection sheets.

Replacement information	This unit standard replaced unit standard 10977 and unit standard 19548.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 November 2006	31 December 2020
Review	2	17 August 2017	31 December 2021
Revision	3	30 August 2018	31 December 2021
Review	4		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.

Title	**Demonstrate knowledge of jointing polyethylene pipe for a gas network**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: polyethylene pipe and jointing equipment, electrofusion jointing of polyethylene pipes, butt fusion jointing of polyethylene pipes and mechanical couplings for a gas network.

Classification	Plastics Processing Technology > Plastics Fabrication

Available grade	Achieved

Guidance Information

1 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 and legislative requirements. This includes the knowledge and use of suitable tools and equipment.

2 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;
Gas (Safety and Measurement) Regulations 2010;
AS/NZS 4645.3:2018 *Gas distribution networks – Plastic pipe systems;*
Plastics Industry Pipe Association of Australia (PIPA) guidelines;
and any subsequent amendments and replacements.

3 Definition
Company and legislative requirements refer to instructions to staff on policy and procedures which are documented in memo or manual format and are available in the workplace. These requirements include but are not limited to – company specifications and procedures, work instructions, manufacturer specifications, product quality specifications and legislative requirements;
Mechanical coupling means a compression-type coupling used for joining pipe. It may include a sealing ring and insert.

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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of polyethylene pipe and jointing equipment for a gas network.

Performance criteria

1.1 Handling, storage, inspection and positioning of polyethylene pipes of different diameters are described.

Range pipe diameter includes – up to 280mm, greater than 280mm; storage includes – location, loading, environment, orientation.

1.2 Handling and storage of jointing equipment is described.

Range types of equipment include – welding machine, clamps, heating element, rotational shaving tool, scraper.

1.3 Site preparation requirements and field checks for pipes up to 280mm diameter and greater than 280mm diameter are described.

Range evidence of three specific requirements is required for each size range.

1.4 Inspection of pipe for damage prior to jointing is described.

Range may include – visual check, measurement, pressure rating.

Outcome 2

Demonstrate knowledge of electrofusion jointing of polyethylene pipes for a gas network.

Performance criteria

2.1 The electrofusion process is described.

Range electrofusion machine, positioning, clamping, scraping, cleaning, fusing, cooling, releasing.

2.2 Factors that affect the quality of electrofusion joints are described in terms of their causes, effects, and appropriate corrective actions.

Range non-environmental factors, environmental factors; cleanliness, ambient temperature, dryness, oxidisation, physical stability, weather.

2.3 Electro-fused pipe testing methods including their purpose and limitations, traceability requirements and reporting are described.

Range may include – visual field checks of weld integrity, pneumatic pressure tests, hydrostatic pressure tests, tensile tests, bend test, crush test, peel decohesion test, flexural beam tests, long-term creep tests;

evidence for at least six methods is required.

2.4 Jointing faults and their causes are identified and methods to avoid them are explained.

Range contamination, pipe misalignment, ovality and pipe geometry, fusion pressure, influence of ambient temperature, fitting assembly, pipe peeling, lack of isopropyl flash-off, lack of restraint; evidence of six causes is required.

Outcome 3

Demonstrate knowledge of butt fusion jointing of polyethylene pipes for a gas network.

Performance criteria

3.1 The butt fusions process is described.

Range butt fusion machine; automatic, semi-automatic; positioning, clamping; facing; cleaning; pre-heating; fusing under pressure; cooling; releasing.

3.2 Factors that affect the quality of butt fusion joints are described in terms of their causes, effects, and appropriate corrective actions.

Range non-environmental factors, environmental factors; cleanliness, ambient temperature, dryness, oxidisation, physical stability.

3.3 Butt fused pipe testing methods including their purpose and limitations, traceability requirements and reporting are described.

Range may include – visual field checks of weld integrity, pneumatic pressure tests, hydrostatic pressure tests, tensile tests, bend test, crush test, peel decohesion test, flexural beam tests, long-term creep tests bead twist/inspection test;
evidence for at least six methods is required.

3.4 Jointing faults and their causes are identified and methods to avoid them are explained.

Range pipe misalignment, cold weld, hot weld, contamination, ovality, fusion pressure, fusion time, influence of ambient temperature, fitting assembly;
evidence of six causes is required.

Outcome 4

Demonstrate knowledge of mechanical couplings for jointing polyethylene pipes for a gas network.

Performance criteria

4.1 Mechanical coupling fittings are described.

Range transition couplers, restrained, non-restrained, temporary, permanent.

4.2 Factors that affect the quality of mechanical coupling joints are described in terms of their causes, effects, and appropriate corrective actions.

Range environmental factors; cleanliness, tool use, physical stability.

4.3 Fitting a mechanical coupling is described.

Range pipe size and type, pressure, temperature, flexibility, expansion.

4.4 Testing a coupling for soundness is described.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	20 November 2009	31 December 2020
Review	2	20 October 2016	31 December 2021
Revision	3	30 August 2018	31 December 2021
Review	4		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.

Title	**Demonstrate knowledge of gas, and the risks and safety precautions for working with live gas in a gas network**		
Level	**3**	**Credits**	**6**

Purpose	People credited with this unit standard are able to: identify the origin and sources of gas in the New Zealand gas industry; identify the basic composition, characteristics, properties and risks of gases in New Zealand; identify and explain the three elements of the fire triangle; and describe the precautions and actions to be taken when working with live gas.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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 60079.10.1:2009 *Explosive atmospheres - Classification of areas - Explosive gas atmospheres*;
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 – Plastic pipe systems;*
AS/NZS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction;*
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*

NZS 5442:2008 *Specification for reticulated natural gas;*
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.

Outcomes and performance criteria

Outcome 1

Identify the origin and sources of gas in the New Zealand gas industry.

Performance criteria

1.1 The origins and types of gas in New Zealand are described in relation to gas networks.

Range may include – natural gas, LPG, butane, propane, tempered LPG, biogas, CNG, bottle gas, hydrogen gas.

1.2 The sources of gas used in New Zealand are described in relation to gas networks.

Range may include – gas fields, biogas, coal gas, land fill gas, sewage farms, manufactured gas.

Outcome 2

Identify the basic composition, characteristics, properties and risks of gases in New Zealand.

Performance criteria

2.1 The basic composition of gases in New Zealand is described in relation to gas networks.

Range natural gas, LPG, biogas.

2.2 Terms used to define gas characteristics are explained according to industry usage.

Range specific gravity, ignition temperature, calorific value, odourless, colourless, non-toxic.

2.3 The properties of gas ignition and flammability are defined according to industry usage.

Range flammability limits, lower explosive limits, higher explosive limits, ignition temperatures, gas mixture in air, behaviours of gases in air, specific gravity.

2.4 The risks arising from the main properties of gas are identified.

Range visibility, flammability, asphyxiation, specific gravity, odour, ignition temperature.

Outcome 3

Identify and explain the three elements of the fire triangle.

Performance criteria

3.1 The explanation identifies the three basic components that must be present for a fire or explosion to occur.

3.2 The explanation identifies sources of ignition of reticulated gas.

Outcome 4

Describe the precautions and actions to be taken when working with live gas.

Performance criteria

4.1 The description includes the definition of a live gas operation according to AS/NZS standards.

4.2 Safety requirements for working in a live gas situation are described.

Range limitations, personnel, equipment, site safety, excavations, underground services, protection of public.

4.3 The precautions to be taken to prevent fire, explosion, and asphyxiation are described.

Range gas monitoring, exclusion zone, ignition sources.

4.4 The actions to eliminate sources of ignition are described.

Range sources of ignition – tools, stray electric currents, naked flames and smoking, electrical equipment, static electricity, vehicles, machinery, non-intrinsically safe equipment (such as cell phones).

4.5 Actions to be taken in the event of a gas fire, explosion, and asphyxiation are described.

Replacement information	This unit standard replaced unit standard 12442, unit standard 12524 and unit standard 17690.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2021
Review	2		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.

Title	**Inspect gas pipeline environments, cased crossings and aerial spans**		
Level	**4**	**Credits**	**6**

Purpose	People credited with this unit standard are able to: describe the requirements for gas pipeline environment inspections; carry out inspections of gas pipeline environments; inspect cased crossings on gas pipeline systems; inspect an aerial span on gas pipeline systems; and communicate and document the results of the inspection of gas pipeline systems.

Classification	Gas Industry > Gas Transmission Operations

Available grade	Achieved

Guidance Information

1 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

2 Performance of the outcomes of this unit standard must comply with the following:
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 4645.1:2008 *Gas distribution networks – Network management*;
AS/NZS 4645.2:2008 *Gas distribution networks – Steel pipe systems*;
AS/NZS 4645.3:2008 *Gas distribution networks – Plastic pipe systems*;
AS 2885.1-2012 *Pipelines – Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance*.

3 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.

4 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.

5 Where aerial inspections are being undertaken, all aircraft safety procedures and pilot instructions must be followed.

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.

Outcomes and performance criteria

Outcome 1

Describe the requirements for gas pipeline environment inspections.

Performance criteria

1.1 Requirements for pipeline environment inspections are described.

Range planned maintenance, natural disasters, requests, inspection technique.

Outcome 2

Carry out inspections of gas pipeline environments.

Range must include a minimum of two inspections using any of the following inspection techniques – walking, vehicle, aerial.

Performance criteria

2.1 Conditions of right of way to easement are identified and adhered to.

2.2 Maps and plans are read, and the exact area being inspected is identified and described in accordance with inspection technique requirements.

2.3 Resource requirements are located and sourced.

Range may include – plant, tools, personal protective equipment, documentation, personnel, communication equipment, camera, recorder, paper, observation forms.

2.4 Safety precautions and safety equipment are identified and used according to inspection technique.

2.5 Issues with the environment around the pipeline are identified, and their effects and location relative to the pipeline are assessed.

Range may include – planting and vegetation encroachment, slope erosion, pipe trench erosion, land movement, changes in land use.

2.6 All warning and danger signs are confirmed as being fixed, clear, and legible.

2.7 Indications of leaks or defects are identified, and follow up actions are initiated.

Range may include – dead vegetation, contaminated ground, contaminated waterways, subsidence, frozen ground, gas detection, corrosion.

2.8 All maintenance requirements are noted for action.

2.9 Current land use, application, and conditions are established and matched against existing alignment plans and any discrepancies reported.

Range may include – changes in land use, new subdivisions, industrial developments, changes in water levels and flows, required development or extension of waste areas.

Outcome 3

Inspect cased crossings on gas pipeline systems.

Range may include – sleeved, concrete cased.

Performance criteria

3.1 Inspection of cased crossings is carried out.

3.2 Inspection of vent pipes is carried out.

Range corrosion, paint condition, protection from vehicles, signage, gas leak detection.

3.3 All maintenance requirements are noted for action.

Outcome 4

Inspect an aerial span on gas pipeline systems.

Performance criteria

4.1 Pipe coating condition is identified in accordance with maintenance requirements.

Range paint condition, frequency of coating repairs, amount of corrosion.

4.2 Transition from underground to above ground pipe coating and wrapping requirements is identified.

Range type of wrap, condition, adhesion to pipe, condition of pipe, ground composition.

4.3 Protective barrier maintenance requirements are identified.

Range integrity of barrier, corrosion.

4.4 Condition of support devices is inspected in accordance with regulatory requirements.

Range may include – integrity of supports, corrosion, ground stability, paint condition, visual impact, rubber sleeving.

4.5 Signage is checked.

Range may include – damage, accuracy, location, missing.

4.6 All maintenance requirements are noted for action.

Outcome 5

Communicate and document the results of the inspection of gas pipeline systems.

Performance criteria

5.1 Results of the inspection are reported.

Range may include – relevant documentation, reports, plans, follow up actions;
internal, external notification.

Replacement information	This unit standard replaced unit standard 9546 and unit standard 9554.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	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.

Title	**Demonstrate knowledge of gas pipelines and networks**		
Level	**3**	**Credits**	**6**

Purpose	People credited with this unit standard are able to demonstrate knowledge of: gas transmission pipelines and distribution networks; the end use and supply requirements of a gas network; gas network components; the methods of handling, storage, and transportation of gas network components; and gas pressure in a gas network.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 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.

2 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 – Plastic 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;*
and any subsequent amendments and replacements.

3 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.

4 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.

5 The network does not include any piping downstream of the meter outlet or, where there is no gas measurement system, downstream of the custody transfer point.

6 Definition
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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of gas transmission pipelines and distribution networks.

Performance criteria

1.1 Gas stations are described according to their function.

Range compressor, gate, metering, scraper, main line valve, pressure control, pressure reduction, district regulator.

1.2 Equipment used in stations is described according to their function.

Range includes but is not limited to – inlet valve, separator, heater, filter, pressure control valve, pressure safety valve (relief and slam-shut), non-return valve, meter, corrector, outlet valve, odorant vessel, pig trap..

1.3 Transmission pipelines and distribution networks are described according to their construction material and coatings.

Range material – steel, high density polyethylene, polyethylene, cast iron; coatings – coal tar enamel, extruded polyethylene, fusion bonded epoxy.

Outcome 2

Demonstrate knowledge of the end use and supply requirements of a gas network.

Performance criteria

2.1 Gas transmission pipelines are described according to services provided.

Range distribution networks, direct supply to industrial customers.

2.2 A gas distribution network is described according to its end use.

Range commercial, industrial, residential.

2.3 Gas transportation is described according to supply requirements.

Range may include – flow, pressure, capacity, continuity, quality, odorisation, gas measurement.

Outcome 3

Demonstrate a basic knowledge of gas network components.

Performance criteria

3.1 Gas network system components are described according to their function.

Range pipes, tubing, fittings, flanges, gaskets.

3.2 Gas network system components are described according to their application.

Range pipe standards, design codes, pressure rating.

3.3 Gas network system joints are described according to their application.

Range steel welded, butt fusion, electrofusion, screwed, flanged, compression fittings, cathodic protection isolation kits, sealants.

3.4 Gas network system valves are described according to their function and application.

Range may include – ball, plug, globe, gate, needle.

3.5 Gas network system valve actuators are described according to their function and application.

Range manual, pneumatic, electric, hydraulic.

Outcome 4

Demonstrate knowledge of the methods of handling, storage, and transportation of gas network components.

Performance criteria

4.1 Methods of identifying, handling, transporting, and storing gas network components are described.

Range may include – badge plate, specifications, certificates, dust caps, packaging, sealing wire, weight.

Outcome 5

Demonstrate knowledge of gas pressure in a gas network.

Performance criteria

5.1 Types of gas pressure are defined.

Range gauge, atmospheric, absolute.

5.2 Units of pressure and the relationship between them are defined.

Range metric, imperial.

5.3 Pressure ranges in a gas network are defined according to NZS/AS 2885, AS/NZS 4645 and specific company operating pressures.

Range low, medium, intermediate, high.

5.4 Devices for the measurement of gas pressure are described.

Range may include – water gauge, bourdon tube gauge, pressure recorder, data logger, digital devices, pressure transducers, mercury gauges.

Replacement information	This unit standard replaced unit standard 12520, unit standard 12521, unit standard 19541 and unit standard 19542.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2021
Review	2		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.

Title	**Demonstrate knowledge of flow stopping in a gas network**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to demonstrate knowledge of flow stopping techniques and their application; and describe flow stopping operations in a gas network.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but not limited to, workplace assessment. 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. *Gas distribution networks.*
AS/NZS 4645.2:2008 *Gas distribution networks – Steel pipe systems*;
AS/NZS 4645.3:2008 *Gas distribution networks – Plastic pipe systems;*
AS 2885. *Pipelines – Gas and liquid petroleum;*
and any subsequent amendments and replacements.

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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.

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 Definition
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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of flow stopping techniques and their application.

Performance criteria

1.1 Flow stopping techniques are identified according to their gas industry application.

Range isolation valves, squeeze off, bag stop, stopple.

1.2 Flow stopping technique limiting factors are identified and described.

Range pipe material, pipe size, pipe operating pressure, pipe condition.

Outcome 2

Describe flow stopping operations in a gas network.

Performance criteria

2.1 Flow stopping techniques are described according to basic principles of operation.

Range isolation valves, squeeze off, bag stop, stopple.

2.2 Flow stopping operations are described according to potential hazards associated with incorrect application of equipment, and the steps to avoid them are described.

Range potential hazards may include – uncontrolled gas release, inadequate isolation, failure of sealing element, incorrect valve operation, supply interruption, pipe damage, static electricity, pneumatic energy release;
steps to avoid them may include – double block & bleed, controlled venting, bypass, valve lock and tag, locking device, limiting device, continuity bond, restraint, exclusion zones.

Replacement information	This unit standard replaced unit standard 25607 and unit standard 25611.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2021
Review	2		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.

Title	**Connect, test, and purge mains and services in a gas network**		
Level	**4**	**Credits**	**8**

Purpose	People credited with this unit standard are able to: locate and identify procedures, documentation, and equipment to perform a pneumatic test, connect and purge a gas main or service; prepare to connect, test, and purge a gas main or service; connect services to a gas main; carry out pneumatic pressure tests on a gas main or service; liven up and purge a gas main or service; reinstate site; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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.

3 Performance of the outcomes of this unit standard must comply with the following:
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 4645.1:2008 *Gas distribution networks – Network management*;
AS/NZS 4645.2:2008 *Gas distribution networks – Steel pipe systems*;
AS/NZS 4645.3:2008 *Gas distribution networks – Plastic pipe systems;*
AS 2885.1-2012 *Pipelines – Gas and liquid petroleum Design and construction.*

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;
British standards (BS) may be found at www.standards.govt.nz;
International Standards Organisation (ISO) standards may be found at www.iso.org.

Gas Industry Protocols (GIP) may be found by contacting the Gas Association of New Zealand www.gasnz.org.nz;
National Association of Corrosion Engineers standards (NACE) may be found at www.nace.org;
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 Pipelines may be polyethylene or steel. This unit standard excludes pigging of pipelines.

7 Definition
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.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment to perform a pneumatic pressure test, connect and purge a gas main or service.

Performance criteria

1.1 Documentation and company procedures for testing, connecting and purging a gas main or service are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, utility plans, mark-outs, consents, easements.

1.3 Potential environmental and safety risks are identified.

1.4 Methods of connecting services and mains to types of gas mains are described.

Range methods may include – electrofusion jointing, mechanical couplings, steel welding;
drill and tap types may include – polyethylene, cast iron, low pressure steel, medium pressure steel, intermediate pressure steel, inserted main.

1.5 Methods of breaking into the casing pipe where there is an inserted gas main are described.

Range may include – wheel cutters, window cutters, cast iron cutters, exploratory drill hole.

1.6 Types and function of pneumatic pressure testing and purging equipment, components, and materials are identified and described.

Range equipment may include – gauge, compressor, test head, leak detection equipment, purge stack, flare stack, gas detection equipment, tools, fittings.

1.7 Potential risks of incorrect application and operation of equipment and procedures, and the steps to avoid them are described.

1.8 Resource requirements are identified and sourced.

Range plant, tools, materials, documentation, system components, personnel, communication equipment, personal protective equipment.

Outcome 2

Prepare to connect, test, and purge a gas main or service.

Performance criteria

2.1 Safety and environmental risks are identified, and controlled.

Range risks may include – gas escape, fire, explosion, asphyxiation, other utilities, excavations;
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, environmental protection.

2.2 Testing, connecting, and purging equipment for specified job is prepared and positioned.

Range may include – gauge, compressor, test head, leak detection equipment, purge stack, flare stack, gas detection equipment, tools, fittings.

2.3 Preparation ensures that pipe work and fittings are anchored in position, pipe systems are isolated, air vents and drainage points are positioned according to design and company requirements.

Outcome 3

Connect a gas service to a gas main.

Performance criteria

3.1 Gas main is prepared for connection, according to type.

Range type may include – polyethylene, cast iron, low pressure steel, medium pressure steel, inserted main.

3.2 Gas service is connected.

Range may include – electrofusion jointing, mechanical couplings, steel welding, drill and tap.

3.3 Carrier pipe is protected from and sealed to casing pipe.

Range anti-shear sleeve, sealing foam, denso/petrolatum tape, polyvinylchloride tape.

Outcome 4

Carry out a pneumatic pressure test on a gas main or service.

Performance criteria

4.1 Pneumatic test pressure is raised, and pressure level and security of pipe system are monitored.

4.2 Test equipment and pipe joints are tested for soundness.

4.3 Stabilisation period is timed.

4.4 Atmospheric pressure reading is obtained.

4.5 Test period is timed, and pressure and time readings are recorded.

Range initial readings, final readings.

4.6 Leaks are traced and repaired, and re-testing is completed.

4.7 On completion of the test, pipe is depressurised in a controlled manner and test equipment is disconnected.

4.8 Record of test is completed.

Outcome 5

Liven up and purge a gas main or service.

Performance criteria

5.1 Gas main or service is livened up.

Range may include – puncture, tap, drill, squeeze off, valve, flow stop.

5.2 Purging equipment is assembled and positioned.

Range may include – purge stack, flare stack, continuity bond, gas detector, fire extinguisher.

5.3 Equipment and pipe are pressurised and checked for soundness.

5.4 Leaks and damaged items are identified, are repaired or replaced, and are reported.

5.5 Purging is carried out.

5.6 Unacceptable pressure conditions are identified and appropriate actions taken.

5.7 Specified gas concentration is achieved at all vent pipes.

5.8 Purging equipment is depressurised and disconnected.

Outcome 6

Reinstate site.

Performance criteria

6.1 Equipment and materials left temporarily on site are stored safely and securely, or arrangements are made for their collection.

6.2 Tools, equipment, and materials are removed from site.

6.3 Worksite is reinstated and made safe.

Outcome 7

Complete reporting and documentation.

Performance criteria

7.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

7.2 Records and documents are completed and processed.

Range may include – job card, test sheets.

Replacement information	This unit standard replaced unit standard 19546 and unit standard 19547.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	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.

Title	**Demonstrate knowledge of pigging on a gas network pipeline**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to demonstrate knowledge of pigging on a gas network pipeline.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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 *Gas distribution networks; t*AS 2885. *Pipelines – Gas and liquid petroleum;*
and any subsequent amendments or 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.

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.

Pigs are devices for insertion into pipelines for the purpose of cleaning or inspecting the lines or separating products.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of pigging on a gas network pipeline.

Performance criteria

1.1 Reasons for pigging pipelines are described.

Range internal cleaning, product separation, pipeline geometry, pipe wall metal loss, pipeline mapping, crack detection.

1.2 Types of pigs used for pigging applications are described.

Range may include – foam, spherical, cup, wire brush, magnetic, batch, gauge plate, magnetic flux leakage, XYZ, ultrasonic.

1.3 Hazards and controls for a pigging operation are described.

Range hazards may include – gas atmosphere, gas venting, noise, waste products, spontaneously combustible materials, manual lifting & handling, stuck pig, sudden energy release.
controls may include – personal protective equipment, gas detection, pressure monitoring, waste containment and disposal, lifting and loading equipment, pig tracking, catchment, correct valve operating sequence, restraint.

1.4 Ancillary equipment for a pigging operation is described.

Range may include –, communication equipment, , acoustic listening device, timer box.

1.5 Pig loading and launching is described.

Range may include – pig configuration, pig trap, valve sequence, venting, pressure differential, flow rate, pig log.

1.6 Pig tracking is described.

Range may include – pressure monitoring, above ground pipework, vent pipe, listening point, aerial crossing, acoustic listening device, timer box.

1.7 Pig receiving is described.

Range may include – pig trap, valve sequence, venting, pressure differential, catchment, waste containment, lifting & unloading equipment, pig condition, pig log.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2021
Review	2		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.

Title	**Interpret and use gas terminology, signage, plans and drawings to identify assets in a gas network**		
Level	**3**	**Credits**	**6**

Purpose	People credited with this unit standard are able to: identify and interpret industry specific symbols, signs, and terminology used in the gas industry; interpret plans and drawings used in a gas network; prepare equipment, posts, and signs for marking the gas pipeline; install and maintain posts and signages in a gas network; and complete reporting and documentation.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Excavation Safety Good Practice Guidelines ISBN: 978-0-908336-49-4 (online);
Guide for Safety with Underground Services ISBN 0-477-03665-1;
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/NZS 2885.1-2018 *Pipelines – Gas and liquid petroleum Design and construction;*
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*
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.

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 Definition
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.
Signage may refer to signs, posts.

Outcomes and performance criteria

Outcome 1

Identify and interpret industry specific symbols, signs, and terminology used in the gas industry.

Performance criteria

1.1 Meaning and application of terminology relevant to the site is identified.

Range technical, equipment, safety, general, road.

1.2 Industry specific symbols and signs are identified and interpreted.

Range may include – chemical, safety, road, site specific, hazard, mapping, reticulation, technical.

1.3 Types of safety signs and their application are identified.

Range may include – caution, warning, danger, emergency, fire, prohibition, mandatory.

1.4 Site specific safety signs are interpreted and related to site conditions.

Range chemical data, road signage, reticulation, mapping, pressure.

1.5 Placement and locations of signage is identified from drawings.

Range may include – centre lines, easements, road offsets, posts, poles, gates, roads, river crossings, stations, fences, bridges.

Outcome 2

Interpret plans and drawings used in a gas network.

Performance criteria

2.1 Plans are located and symbols used on plans and drawings are interpreted to identify types of buried and above ground plant.

Range may include – New Zealand symbols, industry specific symbols, gas network plans, other service authorities.

2.2 Different types of drawings that are encountered in the gas industry are described.

Range may include – process flow drawings, piping and instrumentation drawings, equipment data sheets, vendor's drawings, construction drawings, key sheets, base sheets, different scales, computer, tablet, field books.

2.3 Drawings for other service authorities are identified.

Range may include – local council, sewer, water, telecommunications, electrical supply, other gas utilities, cable television, regional councils.

Outcome 3

Prepare equipment, posts, and signs for marking the gas pipeline.

Performance criteria

3.1 Drawings from other service authorities and utilities are sourced to identify services.

3.2 The location and characteristics of gas mains and plant are identified.

Range may include – pipe size, operating pressure, pipe materials, cover valves, siphons, pressure points, cathodic protection test points, polyethylene squeeze-off points, ducting, valves.

3.3 The location of other utilities, underground plant, and equipment is identified and colour coded.

Range cables, pipes and underground services and plant.

3.4 Safety hazards are identified and controls planned.

Range hazards may include – gas escape , other utilities, excavations, traffic, general public.
controls may include – signage, barriers, personal protective equipment, safe access and egress, temporary traffic control, environmental protection, other gas utilities located.

3.5 Signage is selected, and information displayed on sign is confirmed.

Range information product details, contact details, hazards.

3.6 Equipment for the installation of signage is prepared.

Outcome 4

Install and maintain signage in a gas network.

Performance criteria

4.1 Signage is installed and maintained.

Range may include – painting, clearing, weed control, visible signage.

4.2 Signage is placed indicating asset location and required information.
Range assets may include pipelines, district regulator stations, gas meters, valves, pipe crossings.

Outcome 5

Complete reporting and documentation.

Performance criteria

5.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work, deviations to plans.

5.2 Records and documents are completed and processed.

Replacement information	This unit standard replaced unit standard 9543, unit standard 10994 and unit standard 11326.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	31 December 2021
Review	2		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.

Title	**Read and interpret gas metering equipment**		
Level	**3**	**Credits**	**15**

Purpose	People credited with this unit standard are able to: demonstrate knowledge of the types, principles, design, construction, and application of low capacity gas pressure control equipment; describe the types, operation, application, and handling of meters and correctors used in a gas network; describe the effect of pressure, temperature and altitude on a GMS; identify equipment and procedures for reading and interpreting gas metering equipment; and use equipment and procedures for gas meter reading.

Classification	Gas Industry > Gas Measurement

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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.

3 Performance of the outcomes of this unit standard must comply with the following:
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 4645.1:2008 *Gas distribution networks – Network management*;
NZS 5259:2015 *Gas measurement*.

4 References
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.

Company requirements may influence what equipment and procedures are used for a particular job; for example, service level agreements, financial requirements, technical requirements, regulatory requirements, safety requirements, information requirements.

GMS means gas measurement system.

Low capacity gas pressure control equipment excludes pilot-operated regulators, and active monitor and automatic stream selection configurations.

Meters in this unit standard means meters up to and including 25 cubic metres per hour.

Opso means over-pressure shut-off.

Upso means under-pressure shut-off.

7 Range

Evidence is required of reading and interpreting industrial meters and either domestic or commercial meters.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the types and principles of low capacity gas pressure control equipment.

Performance criteria

1.1 The three basic elements of pressure control equipment are identified and described in terms of their function.

1.2 Components of gas pressure control equipment are defined according to gas industry terminology.

Range spring, valve, valve seat, diaphragm, valve stem/spindle, internal relief, breather, orifice, pilot, weight.

1.3 Low capacity gas pressure control equipment and symbols are identified and described according to gas industry terminology.

Range regulators, slam shut, upso valve, opso valve, relief valve.

1.4 Low capacity gas pressure control equipment types are identified and their features described in terms of gas industry application.

1.5 Low capacity gas pressure control equipment is described in terms of principles of operation and application.

Range internal relief, separate relief, regulators, upso valve, opso valve, slam shut, stage control.

Outcome 2

Demonstrate knowledge of the design, construction, and application of low capacity gas pressure control equipment.

Performance criteria

2.1 Functions of each component of low capacity gas pressure control equipment are described according to manufacturer's specifications.

Range diaphragm, seat, spring, orifice, vent.

2.2 Application of low capacity gas pressure control equipment is described in terms of system requirements.

Range pressure, flow, control systems, location, configuration.

2.3 Design and construction features of low capacity gas pressure control equipment are described according to system requirements and manufacturer's specifications.

Range materials, pressure, flow, location, droop, speed of response.

2.4 Typical pressure control equipment configurations are described in terms of industry usage.

Range may include sketches.

Outcome 3

Describe the types, operation, application, and handling of meters used in a gas network.

Performance criteria

3.1 Types of meters are identified and described according to system requirements and company procedures.

Range diaphragm, turbine, rotary, ultrasonic;
fixed factor, time of use.

3.2 Operation of meters is described according to system requirements.

Range diaphragm, turbine, rotary, ultrasonic.

3.3 Applications of meters are described according to system requirements.

Range domestic, commercial, industrial, internal, external.

3.4 Storage, handling, and transportation requirements for meters are described.

Range packaging, protection, position, orientation, securing, seals.

Outcome 4

Describe the types, operation, application, and handling of correctors used in a gas network.

Performance criteria

4.1 Types of correctors are described according to system requirements.

Range electronic, pressure, temperature, absolute, gauge.

4.2 The operation of correctors is described according to system requirements.

4.3 Applications and compliance requirements of different types of correctors are described according to system requirements.

Range commercial, industrial, internal, external.

4.4 Storage, handling, and transportation requirements for correctors are described.

Range packaging, protection, position, orientation, securing, seals.

Outcome 5

Describe the effect of pressure, temperature and altitude on a GMS.

Range NZS 5259.

Performance criteria

5.1 The effects of pressure on a GMS are described.

5.2 The effects of temperature on a GMS are described.

5.3 The effects of altitude on a GMS are described.

Outcome 6

Identify equipment and procedures for reading and interpreting gas metering equipment.

Performance criteria

6.1 Metering equipment and meter reading equipment are described according to types and component parts.

Range metering equipment – meters, correctors, data logger; meter reading equipment – meter record sheets, calculator, calling card, security access, site access, keys, electronic devices.

6.2 Procedures for reading meters are located and interpreted.

Range meter reading, documentation, customer liaison, faults.

6.3 Functions and applications of meter reading equipment are described according to design and company requirements.

Range billing, corrected readings, uncorrected readings, digital, analog, imperial, metric.

Outcome 7

Use equipment and procedures for gas meter reading.

Performance criteria

7.1 Procedures used for reading meters comply with company requirements.

Range meter reading, documentation, customer liaison, faults.

7.2 Equipment is used to read meters.

Range data logger, calculator, record sheets.

7.3 The potential risks of incorrect application and operation of equipment and procedures are identified, and the steps to avoid them are described.

Range incorrect readings, dogs and site risks, systems shut-down.

7.4 Records and documents are completed and supplied to internal bodies and personnel for meter information.

Range billing, recommendation, fault notification, risks.

Replacement information	This unit standard replaced unit standard 12450, unit standard 23084, and unit standard 23088.

Planned review date	31 December 2022

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1	17 August 2017	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.

Title	**Excavate, backfill, compact and prepare for surface reinstatement for a gas network**		
Level	**3**	**Credits**	**10**

Purpose	People credited with this unit standard are able to prepare for excavation operations in a gas network, excavate for a gas network, backfill and compact for a gas network and carry out final preparation prior to surface reinstatement.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and constructio*n;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
Excavation Safety good practice guidelines ISBN 978-0-908336-49-4 (online);
Road Controlling Authority (RCA)specifications;
Good Practice Guidelines for Excavation Safety available at https://worksafe.govt.nz/topic-and-industry/excavation/excavation-safety-gpg/;
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.

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 Definition
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.
Contract specifications include plans, diagrams, and special technical conditions. They do not include special administrative conditions.
Immediate environment refers to the environment in which the work is taking place such as inner city, suburban, or rural, and may include the presence of nearby structures such as power poles and foundations.
Road Controlling Authority (RCA) refers to New Zealand Transport Agency network, local authority requirements and service providers.
Excavation may include – by hand, hydrovac machines, or mechanical excavators. This unit does not include thrusting or directional drilling.

Outcomes and performance criteria

Outcome 1

Prepare for excavation operations in a gas network.

Performance criteria

1.1 Job instructions are sourced and confirmed.

Range may include – network drawings, utility plans, consents, approvals, easements.

1.2 Overhead and underground utlities are identified, located and marked.

1.3 Potential environmental and safety hazards are identified and controlled.

Range hazards may include – live gas, other utilities, noise, working in excavations, deep excavations, confined spaces, groundwater, plant and equipment, ground conditions, weather, vehicles, general public; controls may include – gas detection underground services location and protection, personal protective equipment, signage, barriers, exclusion zones, safe access and egress, shoring, de-watering, temporary traffic control.

Outcome 2

Excavate for a gas network.

Performance criteria

2.1 Excavation is carried out taking into account ground conditions and immediate environment, and the excavation is shored or otherwise stabilised.

2.2 Groundwater is controlled without destabilising the excavation.

2.3 Underground utilities are adequately protected.

Outcome 3

Backfill and compact for a gas network.

Performance criteria

3.1 A check is made to ensure backfill material meets contract specifications and RCA requirements, and any discrepancies are reported.

3.2 Backfill material is placed and compacted in accordance with RCA requirements or contract specifications.

Outcome 4

Carry out final preparation prior to surface reinstatement.

Performance criteria

4.1 Surface reinstatement and final preparation requirements are confirmed.

4.2 Final preparation prior to surface reinstatement is made in accordance with RCA requirements or contract specifications.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Demonstrate knowledge of cathodic protection systems and surveys in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to demonstrate knowledge of the purpose and types of cathodic protection in a gas network and cathodic protection system surveys.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
AS/NZS 4645.1:2018 *Gas distribution networks – Network management*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
AS 2832.1-2015 Cathodic protection of metals part 1*: Pipes and cables*;
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.

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.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the purpose and types of cathodic protection in a gas network.

Performance criteria

1.1 The corrosion process is described.

1.2 The principle and purpose of cathodic protection systems is described.

1.3 Types of cathodic protection systems corrosion prevention are described.

Range galvanic anode, impressed current.

1.4 The purpose of cathodic protection system equipment is described.

Range transformer/ rectifier, anode bed, galvanic anodes, test points, corrosion coupons.

1.5 The current and voltage ranges of cathodic protection systems are identified.

Range output voltage, output current, on-potential, off-potential, polarised potential.

Outcome 2

Demonstrate knowledge of cathodic protection system surveys in a gas network.

Performance criteria

2.1 Reasons for the survey of cathodic protection systems are described.

2.2 The required voltage levels for effective cathodic protection are described.

2.3 Cathodic protection survey equipment is described in accordance with its purpose and use.

Range copper sulphate half-cell, multi-meter, data logger, cathodic protection system interruption device, direct current voltage gradient meter, pipe locator, flange isolation tester, current measuring swain clamps, Class 0 gloves, equipotential mats.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Carry out cathodic protection system monitoring in a gas network.**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to select, prepare and use cathodic protection monitoring equipment and carry out and report on a cathodic protection survey in a gas network.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
AS/NZS 4645.1:2018 *Gas distribution networks – Network management*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
AS 2832.1-2015 Cathodic protection of metals part 1: Pipes and cables;
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.

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.

Outcomes and performance criteria

Outcome 1

Select, prepare and use cathodic protection monitoring equipment in a gas network.

Performance criteria

1.1 Cathodic protection monitoring equipment is selected according to survey requirements.

Range may include – copper sulphate half-cell, multi-meter, data logger, cathodic protection system interruption device, direct current voltage gradient meter, flange isolation tester, current measuring swain clamps, class 0 gloves, equipotential mat.

1.2 Cathodic protection equipment is checked for suitability.

Range may include – test certificate, certification, identification tags, labels.

1.3 Cathodic protection monitoring equipment is operated safely and potential hazards of incorrect use are identified and avoided.

Range equipment – copper sulphate half-cell, multi-meter.

1.4 Cathodic protection survey scope and reporting criteria are determined.

Range on-potential, off-potential, polarised potential.

Outcome 2

Carry out and report on a cathodic protection survey.

Performance criteria

2.1 Carry out a cathodic protection survey in accordance with survey scope.

2.2 Results are recorded and any deviations from the expected range of results are investigated and reported.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Carry out inspections of gas pipeline environments**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to describe the requirements for gas pipeline environment inspections, prepare for and carry out inspections of gas pipeline environments, inspect pipeline appurtenances and above ground pipeline features and complete inspection documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
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.

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 Definition

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.
GIS refers to Geographical Information System.
Safety Management Study means the process that identifies threats to the pipeline network and applies controls to them.

7 Where aerial inspections are being undertaken, all aircraft safety procedures and pilot instructions must be followed.

Outcomes and performance criteria

Outcome 1

Describe the requirements for gas pipeline environment inspections.

Performance criteria

1.1 Requirements for pipeline environment inspections are described.

Range may include – planned maintenance, signage, vegetation control, natural events, land movement, land erosion, identification of interference threats, pipeline code compliance and changes to the safety management study.

Outcome 2

Prepare for and carry out inspections of gas pipeline environments.

Range must include a minimum of two inspections using any of the following inspection techniques – foot, vehicle, aircraft.

Performance criteria

2.1 Route selection is identified from maps, plans and GIS in accordance with inspection technique requirements.

2.2 Access considerations for inspection technique are identified.

Range may include – registered easement, public highway, notification to land owners, conditions of right of way, traffic management.

2.3 Resource requirements are located and sourced.

Range may include – aircraft, vehicle, tools, personal protective equipment, documentation, personnel, communication equipment, camera, recorder, paper, observation forms, pipe locator, probe.

2.4 Hazards are identified, and controlled, according to inspection technique.

Range hazards may include – lone worker, weather, ground conditions, waterways, electric fences, animals, traffic, general public, working in road, aircraft, low level flying;
controls include one of – elimination, or minimisation with control measures.

2.5 Issues with the environment around the pipeline are identified, and their effects and location relative to the pipeline are assessed.

Range may include – interference detection, construction activity, tree felling, planting, vegetation encroachment, signage visibility, variation to surface condition from erosion, land movement, changes in land use, impediments to access to sites.

2.6 All warning and danger signs are confirmed as being compliant with class location, securely fixed, visible and legible.

2.7 Indications of leaks or defects are identified.

Range may include – dead vegetation, contaminated ground, contaminated waterways, subsidence, frozen ground, gas detection, corrosion.

2.8 Current land use, application, and conditions are established and matched against existing alignment plans

Range may include – changes in land use, urban encroachment, new subdivisions, new developments, changes in water levels and flows, required development or extension of waste areas, encroachment of vegetation.

Outcome 3

Inspect pipeline appurtenances and above ground pipeline features.

Range may include – cased crossing, aerial span, cathodic protection test points.

Performance criteria

3.1 Pipelines pipeline appurtenances and above ground pipeline features are inspected.

3.2 Threats to pipeline appurtenances and above ground pipeline features are identified.

Range may include – impediments to access, encroachment from tree threats, vegetation, development affecting operation of equipment, security, safety management study changes, vandalism, corrosion, external damage.

Outcome 4

Complete inspection documentation.

Performance criteria

4.1 Results of the inspection are reported.

Range may include – patrol log, relevant documentation, reports, photos, follow up actions, incident report, emergency response, internal notification, external notification.

Replacement information	This unit standard and Unit Gas XX05 replaced unit standard 30369.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Inspect an aerial span on gas pipeline systems**		
Level	**3**	**Credits**	**2**

Purpose	People credited with this unit standard are able to inspect an aerial span on gas pipeline systems.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and constructio*n;
AS 2885.3-2012 *Pipelines - Gas and liquid petroleum Operation and maintenance*;
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.

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 Definition
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.

Outcomes and performance criteria

Outcome 1

Inspect an aerial span on gas pipeline systems.

Performance criteria

1.1 Pipe coating condition is identified in accordance with maintenance requirements.

Range may include – paint condition, coating type and condition, frequency of coating repairs, amount of corrosion.

1.2 Transition from underground to above ground pipe coating and wrapping requirements is identified.

Range may include – type of wrap, condition, adhesion to pipe, condition of pipe, ground composition.

1.3 Protective barrier maintenance requirements are identified.

Range may include – integrity of barrier, corrosion, signage, visibility.

1.4 Condition of support devices is inspected.

Range may include – integrity of supports, corrosion, ground stability, paint condition, visual impact, rubber sleeving, access.

1.5 Signage is checked.

Range may include – damage, accuracy, location, missing, visibility.

1.6 As found conditions and maintenance work performed is recorded.

Range may include – photographs, non-destructive testing results, check-sheets, incident report, job cards.

1.7 Further remedial work requirements are recorded.

Replacement information	This unit standard and Unit Gas XX04 replaced unit standard 30369.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Use gas metering equipment**		
Level	**3**	**Credits**	**4**

Purpose	People credited with this unit standard are able to identify equipment and procedures for reading and interpreting gas metering equipment and use equipment and procedures for gas meter reading.

Classification	Gas Industry > Gas Measurement

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Gas (Safety and Measurement) Regulations 2010;
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 – Plastic pipe systems;*
AS 2885.3-2012 *Pipelines – Gas and liquid petroleum Operation and maintenance;*
NZS 5259:2015 *Gas measurement;*
and any subsequent amendments and replacements.

4 Range: evidence is required of reading and interpreting domestic and commercial meters.

5 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.

6 Definitions

Company procedures means the documented methods for performing work activities and include health and safety, environmental, and quality management requirements. They may refer to manuals, codes of practice, or policy statements.

Outcomes and performance criteria

Outcome 1

Identify equipment and procedures for reading and interpreting gas metering equipment.

Performance criteria

1.1 Metering equipment and meter reading equipment are described according to types and component parts.

Range metering equipment – meters, correctors, data logger;
meter reading equipment may include – meter record sheets, calculator, calling card, security access, site access, keys, electronic devices, pressure gauge, temperature gauge.

1.2 Procedures for reading meters are located and interpreted.

Range may include – meter reading, documentation, customer liaison, faults.

1.3 Functions and applications of meter reading equipment are described according to design and company requirements.

Range billing, corrected readings, uncorrected readings, digital, analog, imperial, metric.

Outcome 2

Prepare for and use gas meter reading equipment.

Performance criteria

2.1 Potential safety hazards associated with carrying out meter reading are identified and controlled.

Range hazards may include – access, animals, hazardous areas, gas release, electrical voltage.
controls may include – personal protective equipment, gas detection, intrinsically safe equipment, exclusion zones.

2.2 Equipment is used to read meters.

Range may include – meter, corrector, data logger, pressure gauge, temperature gauge, calculator, record sheets.

2.3 The potential faults associated with incorrect application and operation of equipment and procedures are identified, and the steps to avoid them are described.

Range incorrect readings.

2.4 Records and documents are completed and supplied to internal bodies and personnel for meter information.

Range may include – job card, billing, recommendation, fault notification, site hazards.

Replacement information	This unit standard, unit standard GAS XX09, and unit standard GAS XX10 replaced unit standard 30381.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Demonstrate knowledge of standard gas pressure control equipment and metering stations**		
Level	**3**	**Credits**	**8**

Purpose	People credited with this unit standard are able to demonstrate knowledge of the types and principles of standard gas pressure control equipment, and the design, construction, and application of standard gas pressure control equipment.

Classification	Gas Industry > Gas Network Operations

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Gas Act 1992;
Gas (Safety and Measurement) Regulations 2010;
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 – Plastic pipe systems;*
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.

5 Definitions
Company procedures means the documented methods for performing work activities and include health and safety, environmental, and quality management requirements. They may refer to manuals, codes of practice, or policy statements.

S*tandard gas pressure control and metering* includes Pressure Reducing Stations (PRS) and Gas Measurement Systems (GMS) for single point of supply installations with two-stage pressure reduction and installations with a meter bypass stream that is normally closed. The following installations are excluded– district regulator stations, twin stream configurations, active/ monitor configurations.
Opso means over-pressure shut-off.
Upso means under-pressure shut-off.

Outcomes and performance criteria

Outcome 1

Demonstrate knowledge of the types and principles of standard gas pressure control and metering equipment.

Performance criteria

1.1 The three basic elements of a gas regulator are identified and described in terms of their function.

1.2 Standard gas pressure control and metering equipment and symbols are identified and their function described according to gas industry terminology.

Range meter, regulator, filter, slam shut, upso valve, opso valve, relief valve.

1.3 Components of gas pressure control equipment are defined according to gas industry terminology.

Range spring, valve, valve seat, diaphragm, valve stem/spindle, internal relief, breather, orifice, pilot, weight.

1.5 The basic operation of standard gas pressure control and metering equipment is described.

Range internal relief, separate relief, regulators, upso valve, opso valve, slam shut, stage control.

Outcome 2

Demonstrate knowledge of the design, selection, and application of standard gas pressure control and metering equipment.

Performance criteria

2.1 The factors that determine the type of pressure control equipment required for an application are identified.

Range inlet pressure, outlet pressure, flow demand, security of supply, location.

2.2 The types and application of single stream standard gas pressure control installations are identified and described.

Range single regulator, single regulator with internal relief, first and second stage regulators, first and second stage regulators with external relief.

2.3 The effect of the reduction in pressure on temperature across standard gas pressure control equipment is described.

2.4 The factors affecting the location of standard gas pressure control equipment are identified.

Range may include – access, noise, relief venting, ignition hazards, vehicle hazards, ignition sources, aesthetics.

2.5 The factors to consider for identifying, handling, transporting, and storing, gas regulators and relief valves are described

Range may include – badge/data plate, dust caps, packaging, sealing wire, storage.

Replacement information	This unit standard, unit standard GAS XX08, and unit standard GAS XX10 replaced unit standard 30381.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Describe gas metering equipment in a gas network**		
Level	**3**	**Credits**	**3**

Purpose	People credited with this unit standard are able to Describe the types, operation, application, and handling of meters and correctors used in a gas network and describe the effect of pressure, temperature and altitude on a GMS.

Classification	Gas Industry > Gas Measurement

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Gas Act 1992;
Gas (Safety and Measurement) Regulations 2010;
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 – Plastic pipe systems;*
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.

5 Definitions
Company procedures means the documented methods for performing work activities and include health and safety, environmental, and quality management requirements. They may refer to manuals, codes of practice, or policy statements.
GMS means gas measurement system.

Outcomes and performance criteria

Outcome 1

Describe the types, operation, application, and handling of meters used in a gas network.

Performance criteria

1.1 Types of meters are identified and their basic operation described.

Range diaphragm, turbine, rotary, ultrasonic.

1.2 Metering terminology is described according to industry standards.

Range may include – fixed factor, time of use, maximum flow rate, maximum permissible error, pressure differential, operating pressure, check meter, primary meter.

1.3 Applications of meters are described according to system requirements.

Range may include – domestic, commercial, industrial, distribution, transmission.

1.4 Storage, handling, and transportation requirements for meters are described.

Range may include – packaging, protection, position, orientation, securing, seals.

Outcome 2

Describe the types, operation, application, and handling of correctors used in a gas network.

Performance criteria

2.1 Types of correctors are described according to system requirements.

Range electronic.

2.2 The operation of correctors is described according to system requirements.

Range may include – uncorrected volume, corrected volume, absolute pressure, gauge pressure, temperature, absolute, gauge, electronic and mechanical index, synchronizing electronic uncorrected reading with meter reading.

2.3 Applications and compliance requirements of correctors are described according to system requirements.

Range may include – commercial, industrial, distribution, transmission, internal, external.

2.4 Storage, handling, and transportation requirements for correctors are described.

Range may include – packaging, protection, position, orientation, securing, seals.

Outcome 3

Describe the effect of pressure, temperature and altitude on a GMS.

Range NZS 5259

Performance criteria

3.1 The effects of pressure on a GMS are described.

3.2 The effects of temperature on a GMS are described.

3.3 The effects of altitude on a GMS are described.

Replacement information	This unit standard, unit standard GAS XX08, and unit standard GAS XX09 replaced unit standard 30381.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Test, connect and commission a polyethylene (PE) main in a gas distribution network**		
Level	**4**	**Credits**	**12**

Purpose	People credited with this unit standard are able to pig, pneumatic pressure test, connect, purge and commission a PE gas main and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
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.

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 Definition

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.
Connect refers to using tapping fittings, full-flow connections, squeeze offs and valves to join mains in a gas network.
Pigging refers to using cleaning pigs propelled using compressed air or nitrogen.

7 Hydrostatic testing in a gas network is covered by Unit 10972, *Perform hydrostatic tests on gas mains and services.*

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment to pig, pneumatic test, connect, purge and commission a PE gas main.

Performance criteria

1.1 Company procedures for pigging, pneumatic testing, connecting, purging and commissioning gas mains are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, network drawings, network pressure monitoring, job card, test pressure, test duration, consents, easements.

1.3 Methods of connecting new PE mains to different types of gas mains are described.

Range methods may include – electrofusion jointing, mechanical couplings, drill and tap;
types may include – polyethylene, metallic mains, inserted main.

1.4 Reasons for pig usage are described.

Range may include – cleaning, purging, clearing blockages.

1.5 Methods for purging PE mains and the required purge levels are described.

Range methods include - direct purge, indirect purge, purge rider; purge levels, odourant levels, minimum gas-in-air levels.

1.6 Potential environmental and safety hazards associated with pigging, pneumatic testing, connecting, purging and commissioning gas mains are identified and controlled.

Range hazards may include –gas release, flames, excavations, confined spaces, stuck pig, pneumatic release, waste products, noise, vehicles and public.
controls may include - temporary traffic control, signage, barriers, personal protective equipment, safe access and egress, pressure restraint, anchoring, exclusion zones, continuity bond, environmental protection

1.7 Pigging, pneumatic testing and purging equipment, components, and materials are identified and described in terms of type and function.

Range may include – test gauge, air compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, pig launcher, pig receiver, cleaning pigs, continuity bond, tools, fittings.

1.8 Pigging, pneumatic testing and purging equipment is described in terms of potential faults associated with incorrect application and operation, and the steps to avoid them are described.

Outcome 2

Pig a PE gas main using a cleaning pig.

Performance criteria

2.1 Pigging equipment for specified job is prepared and positioned.

Range equipment – cleaning pig, gauges, launcher, receiver, hoses, compressor, anchors, restraints.

2.2 Cleaning pig is loaded.

2.3 Cleaning pig is launched, and pressure is monitored.

2.4 Cleaning pig is received and unloading checks are carried out.

Range catchment, restraint, pressure, debris.

2.5 Cleaning pig is unloaded.

Outcome 3

Prepare to test, connect, and purge a PE gas main.

Performance criteria

3.1 Testing, connecting, and purging equipment for specified job is prepared and positioned.

Range equipment may include – test gauge, compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, continuity bond, earthing equipment, tools, fittings.

3.2 Preparation ensures that pipework and fittings are anchored in position, pipe systems are isolated, and purge stacks and drainage points are positioned.

Outcome 4

Carry out pneumatic pressure test on a PE gas main.

Performance criteria

4.1 Pneumatic test pressure is raised, and pressure level and security of pipe system are monitored.

4.2 Test equipment and pipe joints are tested for strength and leakage.

4.3 Stabilisation period is timed.

4.4 Atmospheric pressure reading is obtained.

4.5 Test period is timed, and pressure and time readings are recorded.

Range initial readings, final readings.

4.6 Where test results show a pressure loss, leaks are traced and repaired, and retesting is completed.

4.7 On completion of the test, pipe is depressurised in a controlled manner and test equipment is disconnected.

4.8 Record of test is completed.

Outcome 5

Connect, purge and commission a PE gas main.

Performance criteria

5.1 Purging equipment is assembled and positioned.

Range may include – purge rider, purge orifice, purge stack, flare stack, continuity bond, gas detector, fire extinguisher.

5.2 Gas main is connected and gas is introduced.

Range may include – puncture, tap, drill, valve, squeeze off, anti-static device.

5.3 Purging is carried out and required purge levels obtained.

5.4 Equipment and pipe are pressurised and checked for leakage.

5.5 Leaks and damaged items are identified, repaired or replaced, and reported.

5.6 Unacceptable pressure or flow conditions are identified and appropriate actions taken.

5.7 Specified gas concentration is confirmed at extremities to achieve commissioning.

5.8 Purging equipment is depressurised and disconnected.

Outcome 6

Complete reporting and documentation.

Performance criteria

6.1 Information is communicated to other parties, both internal and external.

Range may include – special conditions, completion notice, additional work.

6.2 Records and documents are completed and processed.

Range may include – job card, test records, as-built records.

Replacement information	This unit standard, Unit Gas XX12 and Unit Gas XX13 replaced unit standard 30373.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Connect, test, and commission a polyethylene service in a gas network**		
Level	**4**	**Credits**	**8**

Purpose	People credited with this unit standard are able connect, test, purge and commission a polyethylene (PE) gas service and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and constructio*n;
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.

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 Definition

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.
Connect refers to using an electrofusion saddle tee to join a polyethylene service to a polyethylene main or mechanical couplings to a metallic main.

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment to connect, test, purge and commission a PE gas service.

Performance criteria

1.1 Company procedures for connecting, testing, purging and commissioning a gas service are located and interpreted.

1.2 Job instructions are confirmed.

Range instructions may include – site location, network drawing, job card consents, easements.

1.3 Methods of connecting polyethylene services to different types of gas mains are described.

Range methods may include – electrofusion jointing, mechanical couplings drill and tap
types may include – polyethylene, metallic mains, inserted main.

1.4 Reasons for pig usage are described.

Range may include – cleaning, purging, clearing blockages.

1.5 Potential environmental and safety hazards associated with connecting, testing, purging and commissioning a gas service are identified, and controlled.

Range hazards may include –gas release, flames, excavations, confined spaces, pneumatic release, noise, vehicles and public.
controls may include - temporary traffic control, signage, barriers, personal protective equipment, safe access and egress, pressure restraint, anchoring, exclusion zones, continuity bond, environmental protection.

1.6 Methods of breaking into the casing pipe where there is an inserted gas main are described.

Range may include – wheel cutters, window cutters, cast iron cutters, exploratory drill hole.

1.7 Pneumatic pressure testing and purging equipment, components, and materials are identified and described in terms of type and function.

Range equipment may include – test gauge, compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, continuity bond, tools, fittings.

1.8 Pneumatic pressure testing and purging is described in terms of potential hazards of incorrect application and operation, and the steps to avoid them are described.

Outcome 2

Prepare to connect, test, and purge a PE gas service.

Performance criteria

2.1 Testing and purging equipment is prepared and positioned.

Range equipment may include – test gauge, compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, continuity bond, earthing equipment, tools, fittings.

2.2 Preparation ensures that pipe work and fittings are anchored in position, pipe systems are isolated, purge stack is positioned.

Outcome 3

Connect a gas PE service to a gas main.

Performance criteria

3.1 Type of gas main is prepared for connection, according to type.

Range type may include – polyethylene, metallic, inserted main.

3.2 Gas service is connected.

Range may include – electrofusion jointing, mechanical couplings, drill and tap.

3.3 Where necessary, carrier pipe is protected from and sealed to casing pipe.

Range may include – anti-shear sleeve, sealing foam, denso/petrolatum tape, polyvinylchloride tape.

Outcome 4

Carry out pneumatic pressure test on a PE gas service.

Performance criteria

4.1 Pneumatic test pressure is raised, and pressure level and security of pipe system are monitored.

4.2 Test equipment and pipe joints are tested for strength and leakage.

4.3 Stabilisation period is timed.

4.4 Atmospheric pressure reading is obtained

4.5 Test period is timed, and pressure and time readings are recorded.

Range initial readings, final readings.

4.6 Where test results show a pressure loss, leaks are traced and repaired, and re-testing is completed.

4.7 On completion of the test, pipe is depressurised in a controlled manner and test equipment is disconnected.

4.8 Record of test is completed.

Outcome 5

Purge and commission a PE gas service.

Performance criteria

5.1 Purging equipment is assembled and positioned.

Range may include – purge stack, flare stack, continuity bond, gas detector, fire extinguisher.

5.2 Gas is introduced into service.

Range may include– puncture, tap, drill, squeeze off, valve, anti-static device.

5.3 Purging is carried out and required purge levels obtained.

5.4 Equipment and pipe are pressurised and checked for leakage.

5.5 Leaks and damaged items are identified, are repaired or replaced, and are reported.

5.6 Unacceptable pressure or flow conditions are identified and appropriate actions taken.

5.7 Specified gas concentration is confirmed at the riser valve to achieve commissioning.

5.8 Purging equipment is depressurised and disconnected.

Outcome 5

Complete reporting and documentation.

Performance criteria

6.1 Information is communicated to other parties, both internal and external.

Range may include – special conditions, completion notice, additional work.

6.2 Records and documents are completed and processed.

Range may include – job card, test records, as-built records.

Replacement information	This unit standard, Unit Gas XX11 and Unit Gas XX13 replaced unit standard 30373.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.

Title	**Pig, test, connect and commission steel mains and services in a gas network**		
Level	**4**	**Credits**	**12**

Purpose	People credited with this unit standard are able pig, pneumatic pressure test, connect, purge and commission a steel gas main or service, and complete reporting and documentation.

Classification	Gas Industry > Gas Network Construction

Available grade	Achieved

Guidance Information

1 This unit standard is intended for, but is not limited to, workplace assessment. 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;
Resource Management Act 1991;
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 – Plastic pipe systems*;
AS/NZS 2885.1-2018 *Pipelines - Gas and liquid petroleum Design and construction*;

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.

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 Definition
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.
Connect refers to using tapping fittings, full-flow connections and valves to join mains and services in a gas network.
Pigging refers to using cleaning pigs or gauging pigs propelled using compressed air or nitrogen.

7 Evidence is required for both a steel gas main and a steel gas service to achieve this unit standard.

8 Hydrostatic testing in a gas network is covered by Unit 10972, *Perform hydrostatic tests on gas mains and services.*

Outcomes and performance criteria

Outcome 1

Locate and identify procedures, documentation, and equipment to pig, pneumatic pressure test, connect, purge and commission a steel gas main or service.

Performance criteria

1.1 Documentation and company procedures for pigging, pneumatic testing, connecting, purging and commissioning a gas main and a service are located and interpreted in relation to specified job requirements.

1.2 Job instructions are confirmed.

Range instructions may include – site location, network drawings, job card, test pressure, test duration, consents, easements, cathodic protection requirements, welding procedure.

1.3 Methods of connecting steel mains and services are described.

Range methods may include – mechanical couplings, steel welding.

1.4 Reasons for pig usage are described.

Range may include – cleaning, purging, clearing blockages, gauging.

1.5 Methods for purging steel mains and services and the required purge levels are described:

Range methods include – direct purge, indirect purge;
purge levels include – odourant levels, minimum gas-in-air levels.

1.6 Potential environmental and safety hazards associated with pigging, pneumatic testing, connecting, purging and commissioning steel gas mains and services are identified, and controlled.

Range hazards may include –gas release, flames, excavations, confined spaces, welding, stuck pig, pneumatic release, waste products, noise, vehicles and public, electrical.
controls may include - temporary traffic control, signage, barriers, personal protective equipment, safe access and egress, pressure restraint, anchoring, exclusion zones, continuity bond, environmental protection, earthing.

1.7 Pigging, pneumatic pressure testing and purging equipment, components, and materials are identified and described in terms of type and functions.

Range may include – test gauge, compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, pig launcher, pig receiver, cleaning pigs, gauge pigs, continuity bond, tools, fittings.

1.8 Pigging, pneumatic testing and purging equipment is described in terms of potential faults associated with incorrect application and operation, and the steps to avoid them are described.

Outcome 2

Pig a steel gas main or service using a cleaning or gauging pig.

Performance criteria

2.1 Pigging equipment for specified job is prepared and positioned.

Range equipment – cleaning or gauging pig, gauges, launcher, receiver, hoses, compressor, anchors or restraints.

2.2 Pig is loaded.

2.3 Pig is launched and pressure is monitored.

2.4 Pig is received and unloading checks are carried out.

Range catchment, restraint, pressure, debris, deformation.

2.5 Pig is unloaded.

Outcome 3

Prepare to connect, test, and purge a steel gas main or service.

Performance criteria

3.1 Testing, connecting, and purging equipment for specified job is prepared and positioned.

Range equipment may include – test gauge, compressor, test piece, leak detection equipment, purge stack, flare stack, gas detection equipment, continuity bond, tools, earthing equipment, fittings.

3.2 Preparation ensures that pipe work and fittings are anchored in position, pipe systems are isolated, purge stacks and drainage points are positioned.

Outcome 4

Connect a steel gas service to a steel gas main.

Performance criteria

4.1 Gas main is prepared for connection, according to type.

4.2 Gas service is connected.

Range may include – mechanical couplings, tapping fittings, steel welding.

Outcome 5

Carry out a pneumatic pressure test on a steel gas main or service.

Performance criteria

5.1 Pneumatic test pressure is raised, and pressure level and security of pipe system are monitored.

5.2 Test equipment and pipe joints are tested for strength and leakage.

5.3 Stabilisation period is timed.

5.4 Atmospheric pressure reading is obtained.

5.5 Test period is timed, and pressure and time readings are recorded.

Range initial readings, final readings.

5.6 Where test results show a pressure loss, leaks are traced and repaired, and re-testing is completed.

5.7 On completion of the test, pipe is depressurised in a controlled manner and test equipment is disconnected.

5.8 Record of test is completed.

Outcome 6

Purge and commission a steel gas main or service.

Performance criteria

6.1 Gas is introduced into main or service.

Range may include – puncture, tap, drill, valve, anti-static device

6.2 Purging equipment is assembled and positioned.

Range may include – purge stack, flare stack, continuity bond, gas detector, fire extinguisher.

6.3 Equipment and pipe are pressurised and checked for leakage.

6.4 Leaks and damaged items are identified, are repaired or replaced, and are reported.

6.5 Purging is carried out and required purge levels obtained.

6.6 Unacceptable pressure or flow conditions are identified and appropriate actions taken.

6.7 Specified gas concentration is confirmed at extremities to achieve commissioning.

6.8 Purging equipment is depressurised and disconnected.

Outcome 7

Complete reporting and documentation.

Performance criteria

7.1 Information is communicated to internal and external parties.

Range may include – special conditions, completion notice, additional work.

7.2 Records and documents are completed and processed.

Range may include – job card, test records, as-built records.

Replacement information	This unit standard, Unit Gas XX11 and Unit Gas XX12 replaced unit standard 30373.

Planned review date	31 December 2023

Status information and last date for assessment for superseded versions

Process	Version	Date	Last Date for Assessment
Registration	1		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.