6028-21 Level 2 Diploma in Network Construction Operations (Gas) - Main Layer

6028-310 Operate within the gas intermediate pressure range

Assignment guide

www.cityandguilds.com
July 2014
Version 1.0

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1 Assignment

1.1 Assessor guidance

Internal quality assurance

Approved centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications.

Quality assurance includes initial centre approval, qualification approval and the centre's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance, and City & Guilds is responsible for external quality assurance.

Full details and guidance on the internal and external quality assurance requirements and procedures, are provided in the *Centre Manual – Supporting Customer Excellence*, which can be found on the centre support pages of **www.cityandguilds.com**. This document also explains the tasks, activities and responsibilities of quality assurance staff.

Additional Conditions of Use (Assessment Materials)

City & Guilds Assessment Materials are protected by copyright and are supplied only to Approved Centres for use solely for the purpose of summative assessment.

The following conditions, which apply to City & Guilds Assessment Materials, are additional to

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- (where the City & Guilds Assessment Materials are dated examinations), the JCQ Instructions for Conducting Examinations

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- only use the City & Guilds Assessment Materials in formal, summative assessment leading to the award of credit / a qualification and **not** for **any** other purpose (including, but not restricted to, teaching, revision, as practice assessments or for commercial purposes);
- handle and store securely the City & Guilds Assessment Materials in accordance with the following conditions
    - City & Guilds Assessment Material must be accessible to candidates only during formal assessment as governed by the assessment conditions specified for the qualification;
    - Candidate portfolios may contain assessment results referenced to the assessment taken but should not contain the City & Guilds Assessment Materials (such as assessment tasks or questions or candidates' marked scripts if the tests may be reused (unless otherwise stated));
    - the Approved Centre must not make public **in any format** the contents of any City & Guilds Assessment Materials either in part or in full;
    - City & Guilds Assessment Materials must be securely handled and under no circumstances shared with third party organisations or individuals
- seek permission from City & Guilds via their Qualification Consultant if they want to convert City & Guilds Assessment Material for storage, retrieval and delivery in electronic form (ie using some form of e-assessment or e-learning system)
- provide access, on request, to City & Guilds to the system(s) on which the Assessment Materials appear.

Assessments

This qualification is assessed in a number of ways to provide a clear indication of candidate knowledge and skills. These include:

- internally marked questions
- practical tasks

The assessments are set by City & Guilds and are administered by the centre when the candidate is ready. They are then marked and/or graded internally, using the information provided and the outcomes recorded on the documents provided by City & Guilds. Assessments are subject to internal and external verification.

Unless specified, assessments can be completed in any order. Centres will be expected to organise the assessments in a logical order according to the requirements of the candidates and the course eg with regard to work experience placements, visits etc.

As a minimum Tutors should deliver the full breadth of the units and not limit teaching to the assessment tasks contained in this assignment guide. Records of candidate coursework, lesson plans, and samples of candidate work should be kept so they are easily accessible for the Qualification Consultant to sample to evidence the full delivery of the units.

These externally set assessments should be used when delivery of a unit(s) is complete and candidates are ready to undertake the summative assessments. Candidates should be aware of the standard of performance/evidence required of them in order to achieve a pass.

Internally marked questions

The questions should be taken under supervised conditions as closed-book tests, unless specified otherwise. This means that all activities will be completed with the assessor, or other designated supervisor, present. Alternatively, assessors may prefer to ask the questions orally and record individual candidates' responses. For both written and oral questioning, there is only provision for the assessments to be taken in English. If an electronic recording device is used:

- the assessor and candidate must identify themselves at the start of the recording
- the questions asked ***and*** candidate's responses must be clearly recorded
- the data files must be saved and filed in a manner that assures their security and ease of retrieval for verification purposes.

Unless specified, there is no time limit set by City & Guilds and centres should base their timings on the time it takes a prepared candidate to complete the questions comfortably (usually 1-1½ minutes per mark).

The tests are graded **pass or fail** only. Where candidates do not achieve the necessary pass mark as indicated in the marking criteria, candidates can be given a chance to re-sit the questions at a later date.

The tests should be photocopied and handed out to candidates immediately before they take the test. Centres can photocopy the test and hold a stock securely within the centre.

Candidates should be provided with a quiet area in which to sit the test.

Practical tasks

These tasks will require candidates to demonstrate their practical skills. Most practical tasks will be assessed by observation of the candidate carrying out the tasks and/or an assessment of the final outcome/product. Details of how to mark and grade each practical observation are contained within each assignment.

Where artefacts are produced under un-supervised conditions, the assessor will need to take precautions to ensure the work is the candidate's own, (eg through questioning about techniques used etc) and where design is part of the task, that the candidate can explain the development of their idea. These tasks should only be provided to the candidates once it is evident that they are ready to undertake the summative assessment. A realistic timeframe should be set for completion of the task. The submission schedule should be worked out by the centre, governed by the overall assessment plan for the course. The handing out of tasks and the deadlines for their return are matters for agreement between the assessor and the candidates locally. Candidates should be able to negotiate deadlines where they have a good reason for the request, but reliability and punctuality are watchwords of employment and centres will refer to their own centre policy when dealing with late submissions where no good reason is provided.

Candidates may familiarise themselves with the marking criteria prior to the assessment, but are **not** permitted to use any criteria/checklist to work from when completing the practical task.

Introducing the tasks to candidates

The assessor should introduce each task, making sure that the candidates understand what is required of them. It will be beneficial to take the candidates through what is required and the way in which each task will be graded as candidates need to know what is expected of them to get each grade.

Opportunities to repeat tasks

The tasks are summative assessments and, other than to gain a Pass, candidates may not retake tasks to improve grades. It is therefore essential that the tasks are not used for formative purposes and the candidates only attempt them when they are judged to be fully ready. It is at the centre's discretion whether to allow a candidate to repeat a task, unless otherwise specified. A candidate should not be allowed to repeat until it is evident that they are ready to undertake the task.

Candidates can reuse any research that they have previously carried out and supplement their evidence when repeating a task. Unless specified, for internally marked questions, candidates will need to retake the full set of questions again and where provided a different version of the questions should be used. For observations, candidates will need to retake the full task.

Feedback

A feedback sheet has been provided on page 12. Although some feedback may be given verbally, this is often forgotten by the candidate after the assessment, and so, assessors should complete the feedback sheet for each candidate, showing the key information given to the candidate. This will also serve as an action plan for candidates who are unsuccessful in a task and need to do further work before taking the task again.

Notes on using the grading criteria and marking schemes

Only the knowledge and skills required by the unit(s) may be considered for marking and grading. Any additional skills displayed but which are not required for the unit (eg high levels of presentation of materials, IT, communication etc) should not influence the marking or grading.

The tasks must be marked by the centre using the marking and grading criteria provided by City & Guilds. For internally marked questions, model answers will be provided in the Answer Pack which is available to download from **www.cityandguilds.com**. The Answer Pack **must** be held securely by centres and not made available to candidates. Assessors must use the marking and grading criteria

along with the model answers provided for the assessments to award marks or grades, as appropriate.

Recognition of Prior Learning (RPL)

These summative assessments assess candidate learning, including prior learning. RPL may can be used as part of the work project file.

Health and safety / Codes of practice

The importance of safe working practices, the demands of the Health and Safety at Work Act and the Codes of Practice associated with the industry **must** always be adhered to.

The requirement to follow safe working practices is an integral part of all City & Guilds qualifications and assessments, and it is the responsibility of centres to ensure that all relevant health and safety requirements are in place before candidates start practical assessments.

Should a candidate fail to follow correct health and safety practices and procedures during practical assessment, the assessment **must be stopped** and the candidate advised of the reasons why. The candidate should be informed that they have not reached the standard of assessment required. At the discretion of the centre, candidates may retake the assessment at a later date when they are able to work safely. In any cases of doubt, guidance should be sought from the Qualification Consultant.

Quality assurance of assessments

Centres must use the provided documentation, unless otherwise agreed, to ensure that Qualification Consultants can check that evidence for an assessment is complete and ensure that the assessment decision is fair and beyond dispute. Centres may devise additional documentation/forms to support those provided by City & Guilds.

If a candidate's work is selected for external quality assurance sampling, samples of work must be made available to the appointed Qualification Consultant who will ensure that

- the quality assurance co-ordinator is undertaking his/her responsibilities
- the quality assurance co-ordinator is given prompt, accurate and constructive feedback on centre operations
- a report is written on centre activities for City & Guilds.

Retention of evidence

In order to fully support candidates, centres are required to retain candidates' evidence until the next Qualification Consultant sampling activity. However where this is not possible the centre must keep all the relevant assessment records in place to show progress of the candidate throughout their qualification. Alternatively the centre could make arrangements with candidates to call portfolios back to the centre if they are required for scrutiny by the Qualification Consultant. Candidate assessment **records** (see the centre manual for details) must be retained for **three years** after certification.

Entry for assessment and certification

Entry for assessment and certification should be as specified in the Qualification handbook and the Walled Garden.

1 Assignment

1.2 Task specific guidance

To complete *unit 310 Operate within the gas intermediate pressure range*, candidates will be required to undertake one assignment which consists of **five** tasks as follows.

Tasks D and E can be assessed either by work based observation or realistic working environment.

Task A: Knowledge questions
Candidates will be allowed **90 minutes** to complete **23** short answer questions set by City & Guilds.

Task B: Produce a work/project file
To be able to complete this task, candidates will be required to produce and interpret a work / project file on work associated with the gas intermediate pressure range sector based on the location and information provided by the candidate.

Only **one** risk assessments is required for either task B or C or E.

In order to complete this task, centres must provide the candidates with the following documents

- Relevant Legislative Information
- Relevant Industry Standard documents
- Detailed job description of the activity to be carried out. (example job instruction in appendix 1)
- Underground utility plans for the location where the work is to be completed.

Details of the specifications of all materials and equipment, associated with the gas intermediate pressure range sector based on the location and information included in the produced work/project file.

Candidates will be required to produce a lifting plan to complete all work associated with the gas intermediate pressure range sector based on the location and information included in the produced work/ project file.

Candidates will be required to produce the following based on the location and information included in the produced project file.

- A generic risk assessment
- A site specific risk assessment
- A generic environmental risk assessment
- A site specific environmental risk assessment

All risk assessments **must** include the hazards, risks and control measures associated with the gas intermediate pressure range sector based on the location and information included in the produced work/project file.

The candidate will have to identify and list the PPE required ensuring compliance whilst carrying out work on the gas intermediate pressure range associated with the job description.

Task C: Install, test, commission and decommission pressure reduction equipment to an asset up to and including 63 mm or 2” diameter

Candidates will be observed installing, testing, commissioning, and decommissioning on services up to and including 63 mm or 2” diameter using the observation checklist provided.

Task Ci	Select materials and equipment to be used in the gas intermediate pressure range.
Task C ii	Install pressure reduction equipment up to and including 63 mm or 2” diameter.
Task Ciii	Test and commission pressure reduction equipment up to and including 63 mm or 2” diameter.
Task Civ	Decommission pressure reduction equipment up to and including 63 mm or 2” diameter.

For all task candidates should:

- carry out a site specific risk assessment
- select and wear appropiate PPE
- identify relevant tools and equipment to be used
- select and locate all relevant safety equipment.

Task Ci and Cii

Materials should include:

- metalic
- non-metalic
- housings (correct location to be identified).

Equipment to be used should include all of the following and will vary depending on whether a metalic or non-metalic service feed is used:

- pressure reduction equipment
- valves
- test, purge and vent points.

Task Ciii

Candidates **must** test the services and attached pressure reduction equipment and shall include both of the following methods:

- hydrostatic
- pneumatic.

Candidates **must** complete the relevant test and commissioning certificates.

Commissioning will vary depending on the equipment used and should follow the relevant manufacturers documentation/instructions.

Purging procedures **must** be followed dependant on materials or equipment used.

Task Civ

When decommissioning pressure reduction equipment up to and including 63 mm or 2” diameter candidates **must** demonstrate the following

- testing procedures
- purge to nitrogen
- purge from nitrogen to air if required
- leave services and site in a safe condition
- complete all relevant documentation.

Task D: Install cathodic protection on an asset in an intermediate pressure range

Candidates will be observed installing cathodic protection on an asset in an intermediate pressure range using the observation checklist provided.

Task Di Select components used for cathodic protection.
Task Dii Install cathodic protection within the gas intermediate pressure range.

Task E: Install, test, commission, and decommission pressure reduction equipment to an asset above 63 mm or 2" diameter

Candidates will be observed installing, testing, commissioning, and decommissioning on assets above 63 mm or 2" diameter using the observation checklist provided.

Task Ei Select materials and equipment to be used in the gas intermediate pressure range sector above 63 mm or 2" diameter.
Task Eii Install pressure reduction equipment above 63 mm or 2" diameter.
Task Eii Test and commission pressure reduction equipment above 63 mm or 2" diameter.
Task Eii Decommission pressure reduction equipment above 63 mm or 2" diameter.

For all task candidates should:

- carry out a site specific risk assessment
- select and wear appropiate PPE
- identify relevant tools and equipment to be used
- select and locate all relevant safety equipment.

Task Ei and Eii

Materials should include:

- metalic
- non-metalic
- housings (correct location to be identified).

Equipment to be used should include all of the following and will vary depending on whether a metalic or non-metalic service feed is used:

- pressure reduction equipment
- valves
- test, purg and vent points.

Task Eiii

Candidates **must** test the services and attached pressure reduction equipment and shall include both of the following methods:

- hydrostatic
- pneumatic.

Candidates **must** complete the relevant test and commissioning certificates.

Commissioning will vary depending on the equipment used and should follow the relevant manufacturers documentation/instructions.

Purging procedures **must** be followed dependant on materials or equipment used.

Task Eiv

When decommissioning pressure reduction equipment up to and including 63 mm (2” diameter) candidates **must** demonstrate the following:

- testing procedures
- purge to nitrogen
- purge from nitrogen to air if required
- leave services and site in a safe condition
- complete all relevant documentation.

1 Assignment

1.3 Candidate instructions

To complete *unit 310 Operate within the gas intermediate pressure range*, you will be required to undertake **one** assignment which consists of **five** tasks as follows

Task A: Knowledge questions

To be able to complete this task you will be given **90 minutes** to complete **23** short answer questions.

You are permitted to have an un-marked copy of the IGEM document when taking this test.

Task B: Produce a work/project file

To be able to complete this task, you will be required to produce and interpret a work/project file on work associated with the gas intermediate pressure range sector based on the location and information included in the job description provided by your assessor.

In order to complete this task, you will be provided with the following documents:

- relevant legislative information
- relevant industry standard documents
- job description of the work to be carried out
- underground utility plans for the location where the work is to be completed.

Details of the specifications of all materials and equipment, associated with the gas intermediate pressure range sector based on the location and information included in the produced work/project file.

You will be required to produce a lifting plan to complete all work associated with the gas intermediate pressure range sector, based on the location and information included in the produced work/project file.

You will be required to produce the following:

- a generic risk assessment
- a site specific risk assessment
- a generic environmental risk assessment
- a site specific environmental risk assessment.

Your risk assessments **must** include the hazards, risks and control measures associated with the gas intermediate pressure range sector based on the location and information included in the produced work/ project file.

You will be required to identify and list the PPE required to ensuring compliance whilst carrying out work on the gas intermediate pressure range sector associated with the scenario.

Task C: Install, test, commission and decommission pressure reduction equipment to an asset up to and including 63 mm or 2” diameter

You will be observed installing, testing, commissioning and decommissioning pressure reduction equipment on an asset up to and including 63 mm or 2” diameter.

You will be required to:

- select materials and equipment to be used in the gas intermediate pressure range
- install pressure reduction equipment up to and including 63 mm or 2” diameter
- test and commission pressure reduction equipment up to and including 63 mm or 2” diameter
- decommission pressure reduction equipment up to and including 63 mm or 2” diameter.

Task D: Install cathodic protection on asset in an intermediate pressure range

You will be observed installing cathodic protection on an asset in an intermediate pressure range.

You will be required to:

- select components used for cathodic protection
- install cathodic protection within the gas intermediate pressure range.

Task E: Install, test, commission, and decommission pressure reduction equipment to asset above 63 mm or 2” diameter

You will be observed installing, testing, commissioning and decommissioning pressure reduction equipment on an asset above 63 mm or 2” diameter.

You will be required to:

- select materials and equipment to be used in the gas intermediate pressure range sector above 63 mm or 2” diameter
- install pressure reduction equipment above 63 mm or 2” diameter
- test and commission pressure reduction equipment above 63 mm or 2” diameter
- decommission pressure reduction equipment above 63 mm or 2” diameter.

Assignment Operate within the gas intermediate pressure range

Assignment overview

Tasks

There are **five** tasks to this assignment.

A Knowledge questions.

B Produce a work /project file.

C Install, test, commission and decommission pressure reduction equipment to an asset up to and including 63 mm or 2” diameter.

D Install cathodic protection within the gas intermediate pressure range.

E Install, test, commission, and decommission pressure reduction equipment to an asset above 63 mm or 2” diameter.

Assignment coverage

Task	Task name		Assessment criteria
A	A	Knowledge questions.	L/O 1 K1.1 to 1.4 L/O 3 K3.1 to 3.3 L/O 4 K4.1 to 4.2 L/O 5 K5.1 to 5.5 L/O 6 K6.1 to 6.2 L/O 7 K7.1 to 7.4 L/O 8 K8.1 to 8.3,8.5
B	B	Produce a work/ project file	L/O 2 K2.1 to 2.3 L/O 3 K3.1 to 3.3
C	C	Install, test, commission and decommission pressure reduction equipment to an asset up to and including 63 mm or 2” diameter	L/O 5 K5.4,5.6,5.7,5.8, 5.9
D	D	Install cathodic protection within the gas intermediate pressure range	L/O 7 K7.2, 7.5 and 7.6
E	E	Install, test, commission, and decommission pressure reduction equipment to an asset above 63 mm or 2” diameter	L/O 8 K8.4, 8.6, 8.7, 8.8, 8.9

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Candidate assessment record

Assignment feedback and result sheet

Unit number and title		**Assignment**	**Operate within the gas intermediate pressure range**	
Candidate's name			Enrolment number	
Assessor's name			Centre number	
Dates assignment submitted	1st			
	2nd			

Tasks	**1st Submission** **Outcome** Pass/Fail	**Resubmission** **Outcome** Pass/Fail	**IV Signature if sampled**
A			
B			
C			
D			
E			

Assessor/Tutor feedback to candidate on outcome of assessment
Target date and action plan for resubmission (if applicable)

Assessor/Tutor feedback to candidate on outcome of resubmission

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Assignment Operate within the gas intermediate pressure range

Assignment mark sheet

Candidate name **Candidate number**

Centre name Centre number

Task	Evidence	Grade Pass/Fail
A	Knowledge questions	
B	Produce a work/project file	
C	Install, test, commission and decommission pressure reduction equipment to an asset up to and including 63 mm or 2” diameter	
D	Install cathodic protection within the gas intermediate pressure range	
E	Install, test, commission, and decommission pressure reduction equipment to an asset above 63 mm or 2” diameter	

All parts of the tasks must be passed to allow a grade to be claimed.

I can confirm that the evidence listed for this unit is my own work and was carried out under the conditions and context specified in the assessment specification.

Candidate signature Date

I confirm that the candidate has achieved all the requirements of this unit with the evidence listed and the assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Tutor/assessor signature Date

Quality assurance co-ordinator signature (where applicable) Date

External verifier signature (where applicable) Date

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Assignment **Operate within the gas intermediate pressure range**

Task A Knowledge questions.

Learner name:		**City & Guilds learner enrolment number:**	
Assessor name:		**Assessment date:**	

1 List **five** key legislative documents in relation to work in the gas intermediate pressure range. (5 marks)

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……

2 List **five** key industry standard documents in relation to work in the gas intermediate pressure range. (5 marks)

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3 List **five** key Institute of Gas Engineers and Managers documents in relation to work in the gas intermediate pressure range. (5 marks)

……

……

……

4 State **three** consequences of **not** complying with key legislative and industry standard documents. (3 marks)

……

……

……

5 Under the Health and Safety at Work Act, state **two** responsibilities of the

a) employer (2 marks)

……

……

b) employee. (2 marks)

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……

6 List **five** hazards associated with work in the intermediate pressure range. (5 marks)

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7 State **five** risks associated with work within the intermediate pressure range. (5 marks)

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8 List **five** control measures associated with work within the intermediate pressure range. (5 marks)

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9 List **three** items of personal protective equipment (PPE) used in the gas intermediate pressure range. (3 marks)

……

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……

10 List **three** items of safety equipment typically used in the gas intermediate pressure range. (3 marks)

……

……

……

11 Whilst identifying locations for pressure regulating equipment to be used in the gas intermediate pressure range.

a) State what **must** be completed prior to confirming the proposed location. (1 mark)

……

……

b) Identify **four** factors to be considered when identifying locations for pressure regulating equipment. (4 marks)

……

……

……

……

12 When installing a pressure reduction equipment, state the **minimum** recommended clearance from the operational equipment to the emergency isolation valve. (1 mark)

……

……

13 Identify **four** housing requirements for pressure reduction equipment used in the gas intermediate pressure range. (4 marks)

……

……

……

……

14 Identify **three** types of jointing techniques applicable to intermediate pressure services up to and including 63 mm or 2” diameter. (3 marks)

……

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15 a) State the purpose of a quality assurance certification. (2 marks)

……

……

b) State who is responsible for issuing the quality assurance certificate. (1 mark)

……

……

16 Describe the company procedure to be followed when incorrect/faulty materials are encountered in the gas intermediate pressure range. (3 marks)

……

……

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17 Explain the purpose of cathodic protection on metallic systems used in the gas intermediate pressure range. (3 marks)

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18 When working in the gas intermediate pressure range,

a) explain the requirements for insulation joints on pipelines (2 marks)

……

……

b) give **one** example of where an insulation joints could be installed (1 mark)

……

……

c) list **three** pieces of information that is required to be visible on all approved insulation joints. (3 marks)

……

……

……

19 List **three** types of equipment used for completing cathodic protection activities on exposed metallic pipework. (3 marks)

……

……

……

20 When used within the gas intermediate pressure range, identify **two** restrictions for **each** of the following techniques

a) Trenchless technology (2 marks)

……

……

b) Inserted systems (2 marks)

……

……

c) Open cut (2 marks)

……

……

21 State the typical valve arrangements for a pressure reduction installation (PRI) operating in the gas intermediate pressure range. (4 marks)

……

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22 State **three** approved flow stopping methods used in the gas intermediate pressure range. (3 marks)

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23 Identify **three** different jointing techniques applicable to assets above 63 mm in the gas intermediate pressure range. (3 marks)

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Assignment	**Operate within the gas intermediate pressure range**
Task B	Produce a work/ project file

Produce a work/project file for the job description provided, this work/project file must contain all relevant documentation. You will be presented with the following information to assist you in producing this work/project file.

- Detailed job description of the activity to be carried out.
- Underground utility plans for the location where the work is to be completed.

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Assignment	**Operate within the gas intermediate pressure range**
Task C	Install, test, commission and decommission pressure reduction equipment to asset up to and including 63 mm or 2” diameter

Observation checklist

This form is to be used by the Assessor when carrying out assessment with the learner. The assessor needs to briefly describe how the learner achieved the assessment criteria on this form using the space provided.

The learner has:	
selected materials and equipment to be used in the gas intermediate pressure range …… ……	☐
installed pressure reduction equipment up to and including 63 mm or 2” diameter …… ……	☐
tested and commission pressure reduction equipment up to and including 63 mm or 2” diameter …… ……	☐
decommissioned pressure reduction equipment up to and including 63 mm or 2” diameter …… ……	☐

DECLARATION

I confirm that this learner has achieved all the requirements with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor name:	Assessor signature:
Learner name:	Learner signature:
Job site location:	Date:

Assignment	**Operate within the gas intermediate pressure range**
Task D	Install cathodic protection on an asset in an intermediate pressure range

Observation checklist

This form is to be used by the Assessor when carrying out assessment with the learner. The assessor needs to briefly describe how the learner achieved the assessment criteria on this form using the space provided.

The installation must be carried out in dry conditions. Prior to installation the joint must be bench tested using a 500 V insulation tester. The resistance should be not less than 5 M Ohm. The joint order number must be recorded.

The learner has:	
unpacked the kit – and check it is the correct size, class, and that all parts are present, including nut tightening sequence …… ……	☐
attached a continuity bond across the insulation flange …… ……	☐
separated the flange faces, clean, dry and check for squareness …… ……	☐
placed the gasket between the flanges and insert the sleeves …… ……	☐

inserted the bolts through the sleeves and fit insulated washers, then steel washers onto bolt ends …… ……	☐
placed nuts onto the bolts and tighten up in the sequence outlined in the instruction leaflet …… ……	☐
disconnected the continuity bond …… ……	☐
carried out a gas free test (aqueous solutions should not be used) …… ……	☐
bolted ends tested for non-continuity with both sides of flanges	☐
filled flanges gaps using approved methods and materials for above ground pipe work …… ……	☐
filled flanges gaps using approved methods and materials for below ground pipe work …… ……	☐

DECLARATION

I confirm that this learner has achieved all the requirements with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor name:	Assessor signature:
Learner name:	Learner signature:
Job site location:	Date:

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Assignment	**Operate within the gas intermediate pressure range**
Task E	Install, test, commission, and decommission on equipment or assets above 63 mm or 2” diameter

Observation checklist

This form is to be used by the Assessor when carrying out assessment with the learner. The assessor needs to briefly describe how the learner achieved the assessment criteria on this form using the space provided.

The learner has:	
selected materials and equipment to be used in the gas intermediate pressure range …… ……	☐
installed pressure reduction equipment above 63 mm or 2” diameter …… ……	☐
tested and commission pressure reduction equipment above 63 mm or 2” diameter …… ……	☐
decommissioned pressure reduction equipment above 63 mm or 2” diameter …… ……	☐

DECLARATION

I confirm that this learner has achieved all the requirements with the evidence listed. Assessment was conducted under the specified conditions and context, and is valid, authentic, reliable, current and sufficient.

Assessor name:	**Assessor signature:**
Learner name:	Learner signature:
Job site location:	Date:

Assignment Operate within the gas intermediate pressure range

Marking criteia for Task A

Learners must achieve 80% to pass this paper. Learners achieving between 70- 79% can be asked incorrect questions through oral questioning or professional discussion. Learners achieving less than 70% will require additional training.

Question No	Test spec reference	Question	Model answer	Number of marks
1	**01/1.1**	List **five** key legislative documents in relation to work in the gas intermediate pressure range.	The learner should list any **five** from the list below for **five** marks • Health & Safety at Work Act. • Control of Substances Hazardous to Health (COSHH). • Construction (Design and Management) Regulations. • Dangerous Substances & Explosive Atmosphere Regulations. • Gas Safety (Management) Regulations • Management of Health & Safety at Work Regulations. • Pipeline Safety Regulations. • Pressure Systems Safety Regulations • Gas Safety Regulations (Installations and Use) Regulations. • The Lifting Operations & Lifting Regulations Equipment Regulations (LOLER). • Provision & Use of Work Equipment Regulations (PUWER). • Reporting on Injuries, Diseases and Dangerous Occurrences (RIDDOR). **This list is not exhaustive other relevant answers accepted**	**5**

2	**01 /1.1**	List **five** key industry standard documents in relation to work in the gas intermediate pressure range.	The learner should list any **five** from the list below for **five** marks **External Documents:** • Health & Safety Executive Approved Codes of Practice. • L74 - First-aid at work. • L54- Managing construction for health and safety. • L113- Safe use of lifting equipment. • COP 37 - Safety of pressure systems. • Health & Safety Executive Guidance notes • HSG 47. • HSG 65. • HSG 115. • HSG 150. • HSG 159. • HSG 224. • HSG 250. **This list is not exhaustive other relevant answers accepted**	**5**
3	**01/ 1.1**	List **five** key Institute of Gas Engineers and Managers documents in relation to work in the gas intermediate pressure range.	The earner should list any **five** from the list below for **five** marks • Institute of Gas Engineers and Managers (IGEM) suite of documents applicable to work in the gas intermediate pressure range. • (IGEM/TD/1 – Handling, Transport and Storage of Steel Pipe. • IGEM/TD/3 – Distribution Mains <16 bar. • IGEM/TD/4 – Distribution Services <16 bar. • IGEM/TD/13 – Pressure Regulating Installations, IGEM/GL/5 – Procedures for Managing New Works, Modifications and Repairs). **This list is not exhaustive other relevant answers accepted**	**5**
4	**01/ 1.2**	State **three** consequences of **not** complying with key legislative and industry standard documents.	The learner should list any **three** from the list below for **three** marks • Injury • death • Prosecution • prohibition and enforcement notices • Disciplinary procedures • Failure of network.	**3**

			This list is not exhaustive other relevant answers accepted	
5	**01/ 1.3, 1.4**	Under the Health and Safety at Work Act, state **two** responsibilities of the a) employer b) employee.	a) The learners should state **two** of the responsibilities from below for **two** marks • Employers must provide the provision and maintenance of plant and systems of work. • Employers must ensuring safety and absence of risks to health in connection with the use, handling, storage and transport of articles and substances. • Employers must provide information, instruction, training and supervision as is necessary to ensure the health and safety at work of his employees. • Employers must provide a safe place of work under the employer's control and is responsible for the maintenance and condition of this provision. • Employers must provide the provision and maintenance of a working environment for his employees. b) The learners should state **two** of the below responsibilities for **two** marks • You have a legal duty to take care of your own health and safety and that of others affected by your actions. • You must make full use of control measures put into place by your employer. • You should co-operate with your employer so they can comply with any legal duties places upon them. You should not misuse anything provided for you in the interest of your own health and safety.	**2**

			• Working with elevated pressure in the gas intermediate pressure range. • Lifting operations. • Trench collapse.	
7	**03/3.2**	State **five** risks associated with work within the intermediate pressure range.	The learner should list any **five** from the list below for **five** marks • Fire. • Explosion. • Airborne/noise/water/land pollution. • Debris. • Environmental damage. • Asphyxiation. • Escape of gas. • Personal injury. • Loss of gas supply.	**5**
8	**03/3.3**	List **five** control measures associated with work within the intermediate pressure range.	The learner should list any **five** from the list below for **five** marks • Staff competency. • PPE. • Firefighting equipment. • Breathing apparatus. • Lifting plan. • Mechanised lifting equipment. • Trench support. • Access and egress. • Emergency services. • Pressure reduction/isolation of supply. • Media coverage. • Evacuation and safeguarding of life and property. • Extinguish sources of ignition. • Effective communication. • Use of correct waste streams. • Safe Control of Operations (SCO).	**5**
9	**04/ 4.1**	List **three** items of personal protective equipment (PPE) used in the gas intermediate pressure range.	The learner should list any **three** from the list below for **three** marks • Full fire suit made from suitable fire retardant material. • Fire resistant clothing made from suitable fire retardant material. • Eye protection. • Safety headgear. • Ear defenders. • Reflective garments. • Gloves. • Safety footwear. • Dust masks. • Welding visors where appropriate.	**3**
10	**04/ 4.2**	List **three** items of safety equipment typically used in the	The learner should list any **three** from the list below for **three** marks	**3**

		gas intermediate pressure range.	• Breathing apparatus with forced air available. • Personal alarm/gas monitor. • Fire extinguishers. • Intrinsically safe equipment.	
11	**05/ 5.1**	Whilst identifying locations for pressure regulating equipment to be used in the gas intermediate pressure range, a) state what **must** be completed prior to confirming the proposed location. b) identify **four** factors to be considered when identifying locations for pressure regulating equipment.	a) The learner should give a similar answer as stated for **one** mark • A site risk assessment to consider proposed locations shall be carried out in which consideration shall be given to the following factors. b) The learner should list any **four** from below for **four** marks • Accessibility and security. • Provision of a proper means of safe access and egress. • Areas likely to flood, subsidence or other naturally occurring hazards. • Vulnerability to traffic accidents. • Clearance from overhead power cables. • Proximity to tall and occupied buildings.	**1** **4**
12	**05/ 5.2**	When installing a pressure reduction installation, state what is the **minimum** recommended clearance from the operational equipment to the emergency isolation valve.	The learner should give a similar answer as stated for **one** mark • Recommended clearances are a minimum of 4 m from operational equipment for MOP >7 bar.	**1**
13	**05/ 5.3**	Identify **four** housing requirements for pressure reduction equipment used in the gas intermediate pressure range.	The learner should list any **four** from below for **four** marks All housings: • Any vent termination shall be outside the housing. • Any metallic structure shall be earthed. • Appropriate warning and procedural notices shall be displayed. • The materials used in the construction of any housing / compound shall provide. • Low maintenance requirements. • Sound insulation.	**4**

			• Durability. • Weather resistance. • All pipework entering the housing must be appropriately sleeved. • Any opening into the housing should be restricted to doors, ventilation, explosion relief, pipework and ancillary services. • Any door or ventilation aperture should be located at a safe distance from any window, door or aperture of another building.	
14	**05/5.5**	Identify **three** types of jointing techniques applicable to intermediate pressure services up to and including 63 mm or 2" diameter.	The learner should list any **three** from below for **three** marks • Fillet weld joints for steel services. • Mechanical jointing – flanged. • Electrofusion joints. • Branch saddles for intermediate pressure services.	**3**
15	**06/ 6.1**	a) State the purpose of a quality assurance certification. b) State who is responsible for issuing the quality assurance certificate.	a) The learner should give a similar answer as stated for **two** marks • To prove that materials, tool, plant and equipment are fit for purpose, manufactured to agreed standards and tested following manufacture to ensure catastrophic failure is avoided. • There is a requirement for an objective system for the technical evaluation, approval and certification of materials to prove they are fit for purpose, manufactured to agreed standards and tested following manufacture to ensure catastrophic failure is avoided. b) The learner should give a similar answer as stated for **one** mark • These certificate inspections should be issued by and undertaken by competent persons.	**2** **1**
16	**06/ 6.2**	Describe the company procedure to be followed when incorrect/faulty materials are encountered in the gas intermediate pressure range.	The learner should give an answer similar as described below for **three** marks, **one** marks for each correct answer Learners answers may vary depending on the company they work for.	**3 marks in total**

			• Material(s) identified as Incorrect/ Faulty by the Person Responsible on site. • Manual Returns Form completed listing all the necessary information. • Company Expeditor informed via Telephone, Fax or E-mail then a collection arranged and tracking number issued. • Manual Returns Form issued to driver on collection of goods with both depot individual and driver signatures. • Central Distribution Centre checks materials upon arrival. • Returns form will be handed to Logistics (Expediting) and goods inspected. • Vendor contacted and product returned. • Depot contact advised of the outcome.	
17	**07/ 7.1**	Explain the purpose of cathodic protection on metallic systems used in the gas intermediate pressure range.	The learner should give an similar explanation to that below for **three** marks • Cathodic protection is the process for protecting metal structures, such as steel ships and pipelines, from electrolytic corrosion by making the structure the cathode in a cell, either by applying an electromotive force directly (Impressed current system) or by putting it into contact with a more electropositive metal (Sacrificial anode system). Or • Cathodic Protection (CP) is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects protected metal to a more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal. For structures such as long pipelines, where passive galvanic Cathodic protection is not adequate, an external DC electrical power source is used to provide sufficient current.	**3**

18	**07/ 7.3**	When working in the gas intermediate pressure range, a) explain the requirements for insulation joints on pipelines used in the gas intermediate pressure range b) give **one** example of where an insulation joints could be installed c) list **three** pieces of information that is required to be visible on all approved insulation joints to be used within the gas intermediate pressure range.	a) Learner should give an similar explanation to that below for **two** marks The learner answer should include the phrases in bold in their answer to gain the **two** marks Insulation joints/flanges have a **high electrical resistance**, and are thus used to **isolate pipe sections** and earthling systems that would otherwise cause high current drain on CP systems. b) The learner should give an example similar as that below for **one** mark Connections between pipeline systems, connections of different materials, pipe to service connections, metal bridge crossings, AGI or Governor Station offtakes, instrumentation control, and gas conditioning plants. c) The learner should list **three** pieces of information for **three** marks Each insulation joint must be marked on a visible place with the following information: • make • type designation • serial number/Acceptance number • nominal Width • nominal Pressure • steel quality of the pipe ends • mark of the testing agency or of the tester.	**2** **1** **3**
19	**07/7.4**	List **three** types of equipment used for completing cathodic protection activities on exposed metallic pipework.	The learner should list any **three** from the list below for **three** marks • Reference electrode • Voltmeter • Data logger • Voltstick • Pipeline locator • Current interrupters • Timer.	**3**
20	**08/8.1**	When used within the gas intermediate	a) The learner should list **two** restrictions for **two** marks	**2**

		pressure range. Identify **two** restriction for each of the following techniques a) Trenchless technology b) Inserted systems c) Open cut.	**Trenchless technologies Impact Moling -** • Cannot be used on pipe larger than 180 mm • Horizontal Directional Drilling Areas where HDD may not be used are listed below: • inside or within 10 m of the boundaries of holder stations, above Ground Installations and pressure reduction sites • within 10 m of the known location of NT&T pipelines and third party pipelines • within 10 m of oil cooled electric cables and electric stations/sub-stations where their underground plant exits • within terraced streets that contain cellars • public or multi-occupied buildings/premises • where cellars, basements, personnel or service corridors/tunnels protrude from the building line, e.g. hospitals, schools, office blocks, cinemas, theatres, shopping malls/buildings, high rise flats, Ministry of Defence establishments, etc • within the boundary of airports and docks • within areas of special scientific/environmental interest or containing known wildlife habitats, eg Badger sets, etc • landfill sites • known areas of underground mines, voids, cavities, natural caverns which are close to the • Surface. b) The learner should list **two** restrictions for **two** marks **Inserted systems** • length of pipe restricted dependent upon size of parent main • parent main • reduction in capacity	**2**

			• relaxation periods following insertion. C) The learner should list **two** restrictions for **two** marks **Open cut** • cost • amount of disruption to location • soil displacement • environmental impact.	**2**
21	**08/8.2**	State the typical valve arrangements for a pressure reduction installation (PRI) operating in the gas intermediate pressure range.	The learner should state the **four** arrangements for **four** marks • isolation Valve • Slam Shut valve • monitor Regulator • active Regulator.	**4**
22	**08/ 8.3**	State **three** approved flow stopping methods used in the gas intermediate pressure range.	The learner should state any **three** flow stopping methods for **three** marks Approved Flow Stop Methods for use in the Gas Intermediate Pressure Range are • stopple/line stops • double squeeze Off • valve operation of strategic Valves • foam plugging • iris stopple • short stop • folding plugger (Williamson) • IPSCO folding stopple.	**3**
23	**08/8.5**	Identify **three** different jointing techniques applicable to assets above 63 mm in the gas intermediate pressure range.	The learner should state any **three** flow stopping methods for **three** marks • Butt weld joints for steel mains. • Hot work at the parent main. • Mechanical jointing – flanged. • Butt fusion on polyethylene mains. • Electro fusion joints on mains. • Branch saddle connections on polyethylene parent main.	**3**

Number of questions: 23
Total number of marks: 90
Pass: 72 (80%)
Duration: 90 minutes

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