OPITO APPROVED STANDARD

Authorised Gas Tester Training
Level 1
Gas Testing including Confined Space Testing

OPITO Standard Codes

<table>
<thead>
<tr>
<th>Course Title</th>
<th>Course Type</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Authorised Gas Tester Initial Training L1</td>
<td>Classroom-based</td>
<td>9024</td>
</tr>
<tr>
<td>2 Authorised Gas Tester Initial Training L1 (CBT)</td>
<td>Computer-based</td>
<td>9234</td>
</tr>
<tr>
<td>3 Authorised Gas Tester Further Training L1</td>
<td>Classroom-based</td>
<td>9227</td>
</tr>
<tr>
<td>4 Authorised Gas Tester Further Training L1 (CBT)</td>
<td>Computer-based</td>
<td>9235</td>
</tr>
</tbody>
</table>
OPITO STANDARDS

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The contents of this document were developed by an industry workgroup facilitated and supported by OPITO. The workgroup consisted of representation from a cross section of oil and gas industry employers, discipline experts working within the industry and members of the OPITO Approved Training network.

This standard has been verified and accepted through the governance and integrity management model for OPITO standards.

Guidance on this standard is available by contacting OPITO at: Standards Enquiries

This standard has been designed to accommodate global variations in national legislation and regulations. In the absence of relevant national legislation and regulations, OPITO approved centres should use legislative and regulatory criteria specified within this Standard

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<thead>
<tr>
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<th>PAGES</th>
<th>CHANGES MADE BY</th>
<th>CHECKED BY</th>
<th>APPROVED BY</th>
</tr>
</thead>
</table>
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Any amendments made to this standard by OPITO will be recorded above.
Contents

Introduction and Course Description .......................................................................................................................... 5

SECTION A  AGT L1 Training Programme .......................................................................................................................... 7

A.1 TARGET GROUP .................................................................................................................................................. 7
A.2 DELEGATE PRE-REQUISITES ............................................................................................................................... 7
A.3 PHYSICAL AND STRESSFUL DEMANDS OF THE COURSE .................................................................................. 7
A.4 AIM AND OBJECTIVES .......................................................................................................................................... 8
A.5 LEARNING OUTCOMES .......................................................................................................................................... 9
A.6 DELEGATE KNOWLEDGE ASSESSMENT ................................................................................................................ 9
A.7 DURATION AND TIMING OF THE COURSE .............................................................................................................. 10
A.8 THE INITIAL TRAINING PROGRAMME .................................................................................................................. 10

SECTION B  AGT L1 Further Training Programme ........................................................................................................... 14

B.1 TARGET GROUP .................................................................................................................................................. 14
B.2 DELEGATE PRE-REQUISITES ............................................................................................................................... 14
B.3 PHYSICAL AND STRESSFUL DEMANDS OF THE COURSE .................................................................................. 15
B.4 AIM AND OBJECTIVES .......................................................................................................................................... 15
B.5 LEARNING OUTCOMES .......................................................................................................................................... 16
B.6 DELEGATE KNOWLEDGE ASSESSMENT ................................................................................................................ 17
B.7 DURATION AND TIMING OF THE COURSE .............................................................................................................. 17
B.8 THE FURTHER TRAINING PROGRAMME .................................................................................................................. 18

SECTION C  Resources for Training ............................................................................................................................... 21

C.1 STAFF ................................................................................................................................................................. 21
C.2 TRAINER/DELEGATE RATIO ............................................................................................................................... 21
C.3 FACILITIES AND LOCATION OF TRAINING ....................................................................................................... 22
C.4 EQUIPMENT .......................................................................................................................................................... 23

SECTION D  Administration and Certification .................................................................................................................. 24

D.1 JOINING INSTRUCTIONS – NOT APPLICABLE ..................................................................................................... 24
D.2 PERIODICITY .......................................................................................................................................................... 24
D.3 CERTIFICATION .................................................................................................................................................... 24
D.4 COURSE ADMINISTRATION .................................................................................................................................. 25

SECTION E  COMPETENCE UNITS ................................................................................................................................. 26

E.1 DEVELOPMENT OF COMPETENCE STATEMENTS ............................................................................................... 26
E.2 COMPETENCE ASSESSMENT LEVELS ................................................................................................................... 26
E.3 COMPETENCE UNITS AND ELEMENTS: TITLES .................................................................................................. 27

Glossary of Terms and Abbreviations ............................................................................................................................. 36

Appendix 1 OPITO Information ..................................................................................................................................... 36

Appendix 2 Computer Based Learning Packages ....................................................................................................... 37

Appendix 3 Guidance for Delivering Combined AGT (Levels 1,2,3) Course ................................................................ 39
Introduction and Course Description

The international oil and gas industry recognises that a major objective is to prevent incidents occurring, and if they do occur, to control them and minimise their effect. It is important therefore to set common standards of training and to ensure they are maintained.

The authorised gas tester (AGT) role is critical in testing for and ensuring safe working atmospheres, in particular: permit controlled confined spaces, and prior to and during hot work.

The tasks authorised gas testers are required to undertake may vary depending on the workplace operation at the time. The tasks also vary in complexity and responsibility. Therefore, the AGT role has been split into three levels, they are: AGT Level 1, AGT Level 2 and AGT Level 3.

a) **AGT Level 1** is required for those involved with performing a test for oxygen, flammable and toxic gases up to and including working in confined spaces.

b) **AGT Level 2** is required for those involved with testing for flammable gas in preparation for hot work.

c) **AGT Level 3** is required for those who provide safety watch duties by the ongoing monitoring of a hot work site.

Note 1: *The various levels do not represent a progression, but are unique training courses in their own right. An OPITO standard is available for each level.*

Note 2: *In the workplace, persons undertaking Standby/Safety Watch duties at the entrance to a confined space shall be an AGT Level 1 Gas Tester.*

This OPITO Training standard specifies the requirements for an AGT Level 1.
Introduction and Course Description continued.

The specific purpose of this standard is to set out the basic training, knowledge assessment and certification requirements for Authorised Gas Tester Level 1, conducted at OPITO-approved training centres.

It will be for the duty holder or nominated representative to decide which personnel will undergo this training according to the requirements of the employing organisation. Operating companies and employers should also recognise that site-specific training is integral to the training of a gas tester.

AGT Competence

Where there is a need to have competence formally assessed, this will be done at either the workplace through a company’s competence management system or at an approved training centre. The assessment of competence will be conducted against Competence Units 1, 2, and 3 of the Occupational Standard for The Testing for Oxygen, Toxic and Flammable Gases, which is included in Section E of this standard.

An OPITO certificate is currently not awarded for an assessment of competence.

Confirmation of competence will, as always, be decided by the duty holder or duty holder representative.

AGT Levels: Assessment

AGT Level 1: Personnel undertaking this role will be assessed against the Competence Units 1, 2 & 3

AGT Level 2: Personnel undertaking this role will be assessed against Competence Units 2 & 3.

AGT Level 3: Personnel undertaking this role will be assessed against Competence Unit 3.

Training Programme Delivery

Delegates attending this training programme (initial and further training) will be given either:

(a) a series of presentations, or

(b) a computer based training programme (see Appendix 2)

Irrespective of the method used, the training programme will provide the delegates with what they are expected to know and do in their specific AGT role.

Because there is some overlap in AGT levels 1, 2 and 3 training content, it will be up to the operators and training providers to decide how best to deliver the training levels, i.e. as three separate programmes or amalgamated into one or two single programmes.
SECTION A  AGT L1 Training Programme

A.1  Target Group

This programme is designed to meet the initial onshore training and knowledge assessment requirements for personnel preparing to work as Authorised Gas Testers Level 1 and is required for those involved with performing a test for oxygen, flammable and toxic gases up to and including working in confined spaces.

NOTE: In the workplace, persons undertaking Safety Watch duties at the entrance to a confined space shall be an AGT Level 1 Gas Tester.

A.2  Delegate Pre-requisites

No pre-requisites are required.

A.3  Physical and Stressful Demands of the Course

All personnel who participate in gas testing training must be physically and mentally capable of participating fully. The responsibility of declaring any current or pre-existing medical conditions that could have adverse effects to the individual’s state of health while undertaking the training and/or assessment activities lies with the delegate/candidate and/or company sponsoring the delegate. Where doubt exists regarding the fitness of any delegate/candidate, the OPITO-approved Centre should direct the individual to consult a medical officer familiar with the nature and extent of the training.

A.4  Aim and Objectives

The aim and objectives of the AGT Level 1 training programme is to ensure that personnel preparing for a gas tester role are equipped with the knowledge to conduct gas tests for oxygen levels, flammable and toxic gases safely. Their gas testing skills must be assessed either in the workplace or at an approved training centre against the competence units specified in Section E of this standard.

This training programme also equips the delegate with knowledge to conduct gas testing within confined spaces and awareness of associated confined space hazards.

Delegates will also learn about relevant legislative requirements, gas measuring and monitoring equipment and documenting gas test results.
A.5 Learning Outcomes

The learning outcomes are specified for each of the following modules; they are:

MODULE 1 AGT L1 - Initial Training

To successfully complete this module delegates must be able to demonstrate an understanding of:

1. Confined space criteria
2. The hazards of operations within an oxygen deficient, toxic or flammable environment
3. Carrying out a suitable and sufficient risk assessment (TBRA) or (KBRA)
4. Using safe systems of work
5. The implications of organisational and statutory requirements
6. Interpreting operational requirements
7. How to select, use and care for PPE and RPE
8. Working within the Permit to Work system
9. The operating principles of atmosphere monitoring and measuring equipment
10. Gas detector pre-start checks
11. Calibrating the instruments used in atmospheric testing
12. How to set up the relevant detector for each gas testing application
13. The behaviour of different flammable and toxic gases
14. The range and frequency of tests
15. Acceptable levels of flammable and toxic gases
16. Performing gas tests in sequence
17. Obtaining a representative atmosphere sample
18. Monitoring and retesting
19. Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere
20. Interpreting and documenting the results
A.6 Delegate Knowledge Assessment

Delegates attending this training programme will be given a series of explanations and demonstrations by training staff (or computer based training: CBT) to help delegates achieve the specified learning outcomes.

Delegates will be assessed against the learning outcomes specified in section A.5. A multiple choice written test with a minimum of 20 questions must be used to assess the delegates’ understanding of the topics and ALL the learning outcomes must be achieved.

Delegates successfully completing the course will be judged (or assessed) to have been given the underpinning knowledge for Authorised Gas Tester Level 1 to proceed to the workplace for site-specific assessment under direct supervision of a ‘competent person’.

If required, and time permits, extra coaching may be given to delegates by the training provider to enable them to reach the standard which leads to the award of a certificate. However, the time available during a programme may be limited and it should be recognised there may be occasions where other arrangements need to be made for further training.

If any delegate fails to meet the standard, in the opinion of the training providers and after reasonable tuition, the entire Level 1 Initial Training Programme must be repeated for the delegate to be awarded the certificate.

A.7 Duration and Timing of the Course

The optimum ‘contact time’ for classroom delivery is seen as 12 hours.
The optimum contact time for CBT delivery is seen as 25% of the classroom delivery duration.

Where this training is part of a programme of longer duration the total contact time per day must not exceed 8 hours and the total training day must not exceed 10 hours. The total training day includes contact time, refreshment and meal breaks and travel between training sites where applicable.

If training programmes for the AGT Levels 1, 2 or 3 are merged, the combined ‘contact time’ will reduce and is seen as 16 hours. Please refer to Appendix 3 for guidance on combined AGT (Levels 1, 2, 3) course which contains cross mapping of learning outcomes and training elements across the three AGT standards resulting in reduced contact time.

For those who complete the computer-based training (CBT) package the time spent at the terminal should comply fully with the Display Screen Equipment Legislation.
A.8 The Initial Training Programme

The training programme provided below is designed to help delegates achieve the stated learning outcomes specified in section A.5. The order in which elements of the training programme are delivered may vary. However, contents in Appendix 1 must be covered prior to course commencement.

To make efficient use of time and ensure effective learning there should, wherever practicable, be an integration of the three phases of explanation, demonstration and practise. Full use should be made of audio / visual aids and course handout material. Training staff should give practical demonstrations for all training activities which delegates are required to practice and demonstrate.

Prior to the start of the module, the following must be included as part of the introduction by training staff:

(a) **Aim** – The main purpose of the module
(b) **Learning Outcomes** – What the delegates are expected to learn
(c) **Timetable** – Training module duration and timing
(d) **Assessment** – how delegates will be assessed and what they will be assessed against
(e) **Staff** - who will be delivering the training and roles of training support staff.

The time taken for this introduction is expected to be approximately 10 minutes.

The training course consists of the following module and elements:

**Module 1** Authorised Gas Tester Level 1 – Initial Training

Element 1.1 Testing in confined spaces
Element 1.2 Relevant legislative controls
Element 1.3 Atmosphere measuring and monitoring equipment
Element 1.4 Gas testing in confined spaces
Element 1.5 Interpreting and documenting the results
MODULE 1  Authorised Gas Tester  Level 1 – Initial Training

ELEMENT 1.1  Testing in Confined Spaces

Training staff to explain:

1.1.1 Confined space criteria, to include:

(a) Limited openings for entry and exit
(b) Unfavourable natural ventilation
(c) Not designed for continuous worker occupancy
(d) The definition of a confined space as per National Regulations and Approved Codes of Practice (ACOP’s) – for example, The Confined Spaces Regulations 1997 in the UK.

1.1.2 The type of production operation being tested for flammable and toxic gases

1.1.3 The potential cumulative hazards of operations within an oxygen deficient, toxic or flammable environment

1.1.4 Carrying out a suitable and sufficient risk assessment before testing activities and confined space entry

1.1.5 Using safe systems of work, to include:

(a) Appointment of a supervisor
(b) Entry permits
(c) Ventilation
(d) Testing and continuous monitoring of the air
(e) Communications

1.1.6 Using observers to raise the alarm and initiate emergency response
ELEMENT 1.2  Relevant Legislative Controls

Training staff to explain:

1.2.1 The implications of organisational and statutory requirements with respect to gas testing - to include legislation, codes of practice, manufacturers' and company instructions
1.2.2 The fact that the owner is responsible to make the confined space safe for entry
1.2.3 How to interpret operational requirements - to include policies, procedures, instructions, codes of practice and standards
1.2.4 How to select, use and care for PPE for different toxic and flammable gases through risk assessment
1.2.5 Consideration of appropriate levels of respiratory protective equipment
1.2.6 How to work both with and within the Permit to Work system

ELEMENT 1.3  Atmosphere Measuring and Monitoring Equipment

Training staff to explain:

1.3.1 How to access and interpret the relevant operational instructions
1.3.2 The operating principles of atmosphere monitoring and measuring equipment and frequently observed failure modes
1.3.3 The strengths and weaknesses of the various types of atmospheric flammable and toxic gas detection equipment - to include transportable, portable and personal monitors
1.3.4 How to correctly select between aspirating and non-aspirating detectors to obtain a representative sample of the atmosphere being tested
1.3.5 Equipment required in inert atmospheres
1.3.6 Gas detector pre-start checks
1.3.7 Calibrating the instruments used in atmospheric testing
ELEMENT 1.4  Gas Testing in Confined Spaces

Training staff to explain:

1.4.1 The hazards and properties of flammable and toxic gases including oxygen deficiency and enrichment, nitrogen and specialist materials appropriate to the location
1.4.2 The behaviour of different gases – to include heavier than air & lighter than air behaviour and “neutral buoyancy” effect
1.4.3 The range and frequency of tests
1.4.4 Acceptable levels of flammable and toxic gases and the correct amount of oxygen
1.4.5 The implications of WEL for toxic gases and LEL for flammable gases
1.4.6 How to set up the relevant detector for each gas testing application, its potential failure modes and confirming its correct functioning
1.4.7 Performing gas tests in sequence:
   (a) Oxygen deficient or enriched atmospheres – ensure that proper oxygen levels are present
   (b) Flammable atmospheres – ensure that combustible gases are not present
   (c) Toxic atmospheres – ensure that toxic gases are below the exposure limit
1.4.8 How to obtain a representative atmosphere sample from a range of confined spaces
1.4.9 Taking samples at the top, middle and bottom to locate varying concentrations of gases and vapors
1.4.10 Sampling confined spaces at a distance from the opening because air intrusion near the entrance can give a false sense of adequate oxygen present
1.4.11 Testing flammable gases in inert atmospheres
1.4.12 Monitoring and retesting after the initial entry
1.4.13 Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere

ELEMENT 1.5  Interpreting and Documenting the Results

Training staff to explain:

1.5.1 How to interpret the results, to include both normal and abnormal
1.5.2 How to document the results and advise relevant personnel
SECTION B  AGT L1 Further Training Programme

B.1  Target Group

This programme is designed to meet further onshore training and knowledge assessment requirements for personnel working as Authorised Gas Testers Level 1 and is required for personnel working in confined space or acting as a sentry for confined space.

B.2  Delegate Pre-requisites

The delegate must possess a valid AGT Level 1 certificate.
B.3 Physical and Stressful Demands of the Course

All personnel who participate in gas testing training must be physically and mentally capable of participating fully. The responsibility of declaring any current or pre-existing medical conditions that could have adverse effects to the individual’s state of health while undertaking the training and/or assessment activities lies with the delegate/candidate and/or company sponsoring the delegate. Where doubt exists regarding the fitness of any delegate/candidate, the OPITO-approved Centre should direct the individual to consult a medical officer familiar with the nature and extent of the training.

B.4 Aim and Objectives

The aim and objectives of the AGT Level 1 further training course is to refresh and update the knowledge of personnel who have previously successfully completed their AGT Level 1 initial training related to changes to equipment design, legislation, certification and company procedures.
B.5 Learning Outcomes

The learning outcomes are specified for each of the following modules; they are:

MODULE 2 AGT L1 - Further Training

To successfully complete this module delegates must be able to demonstrate an understanding of:

1. Changes to equipment design, legislation and certification
2. The operating principles of atmosphere monitoring and measuring equipment
3. Gas detector pre-start checks
4. Calibrating the instruments used in atmospheric testing
5. How to set up the relevant detector for each gas testing application
6. The behaviour of different flammable and toxic gases
7. The range and frequency of tests
8. Acceptable levels of flammable and toxic gases
9. Performing gas tests in sequence
10. Obtaining a representative atmosphere sample
11. Monitoring and retesting
12. Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere
B.6 Delegate Knowledge Assessment

Delegates will be assessed against the learning outcomes specified in B.5.

A multiple choice written test with a minimum of 20 questions must be used to assess the delegates’ understanding of the topics and ALL the learning outcomes must be achieved.

B.7 Duration and Timing of the Course

The optimum ‘contact time’ for classroom delivery is seen as **7 hours**.

The optimum contact time for CBT delivery is seen as 25% of the classroom delivery duration.

Where this training is part of a programme of longer duration the total contact time per day must not exceed 8 hours and the total training day must not exceed 10 hours. The total training day includes contact time, refreshment and meal breaks and travel between training sites where applicable.

If the training programmes for the AGT Levels 1, 2 or 3 further training are merged, the combined ‘contact time’ will reduce. Please refer to Appendix 3 for guidance on combined AGT (Levels 1, 2, 3) course which contains cross mapping of learning outcomes and training elements across the three AGT standards resulting in reduced contact time.

For those who complete the CBT package the time spent at the terminal should comply fully with the Display Screen Equipment Legislation.
B.8 The Further Training Programme

The training programme provided below is designed to help delegates achieve the stated learning outcomes specified in section B.5. The order in which elements of the training programme are delivered may vary. However, contents in Appendix 1 must be covered prior to course commencement.

To make efficient use of time and ensure effective learning there should, wherever practicable, be an integration of the three phases of explanation, demonstration and practise. Full use should be made of audio / visual aids and course handout material. Training staff should give practical demonstrations for all training activities which delegates are required to practice and demonstrate.

Prior to the start of the module, the following must be included as part of the introduction by training staff:

(a) **Aim** – The main purpose of the module
(b) **Learning Outcomes** – What the delegates are expected to learn
(c) **Timetable** – Training module duration and timing
(d) **Assessment** – how delegates will be assessed and what they will be assessed against
(e) **Staff** - who will be delivering the training and roles of training support staff.

The time taken for this introduction is expected to be approximately 10 minutes.

The training course consists of the following module and elements:

**Module 2** AGT L1 – Further Training
- Element 2.1 Recent Changes
- Element 2.2 Atmosphere measuring and monitoring equipment
- Element 2.3 Gas testing in confined spaces
MODULE 2    Authorised Gas Tester Level 1    -    Further Training

ELEMENT 2.1    Recent Changes

Training staff to explain:

2.1.1 Changes to equipment design, legislation, certification and, where possible, company procedures

ELEMENT 2.2    Atmosphere Measuring and Monitoring Equipment

Training staff to explain:

2.2.1 How to access and interpret the relevant operational instructions
2.2.2 The operating principles of atmosphere monitoring and measuring equipment and frequently observed failure modes
2.2.3 The strengths and weaknesses of the various types of atmospheric flammable and toxic gas detection equipment - to include transportable, portable and personal monitors
2.2.4 How to correctly select between aspirating and non-aspirating detectors to obtain a representative sample of the atmosphere being tested
2.2.5 Equipment required in inert atmospheres
2.2.6 Gas detector pre-start checks
2.2.7 Calibrating the instruments used in atmospheric testing
ELEMENT 2.3  Gas Testing in Confined Spaces

Training staff to explain:

2.3.1 The hazards and properties of flammable and toxic gases
2.3.2 The behaviour of different gases - to include heavier than air & lighter than air behaviour and “neutral buoyancy” effect
2.3.3 The range and frequency of tests
2.3.4 Acceptable levels of flammable and toxic gases and the correct amount of oxygen
2.3.5 The implications of WEL for toxic gases and LEL for flammable gases
2.3.6 How to set up the relevant detector for each gas testing application, its potential failure modes and confirming its correct functioning
2.3.7 Performing gas tests in sequence
2.3.8 How to obtain a representative atmosphere sample from a range of confined spaces
2.3.9 Taking samples at the top, middle and bottom to locate varying concentrations of gases and vapors
2.3.10 Sampling confined spaces at a distance from the opening
2.3.11 Testing flammable gases in inert atmospheres
2.3.12 Monitoring and retesting after the initial entry
2.3.13 Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere
SECTION C   Resources for Training

In order that a training programme may be delivered successfully it is essential that appropriately qualified and experienced people are there to deliver and support the programme and that the appropriate facilities and equipment are in place.

C.1   Staff

Training staff must:

(a)  Have recent, substantial experience of working as an Authorised Gas Tester in the oil and gas or petrochemicals industries or continuous experience in delivering similar training

(b)  Be trained in instructional/lecture techniques and/or have proven instructing/teaching experience

(c)  Be included in an ongoing staff training programme which includes worksite visits to enable them to maintain and update skills and knowledge

All staff will have the appropriate competencies to conduct/assist with the element of training being undertaken.

Personnel assessing against the Competence Units in Section E
Assessors will be discipline experts trained and qualified in assessment techniques.

C.2   Trainer/Delegate Ratio

The maximum number of delegates to be supervised by one instructor at any one time during each theory activity is twelve (1:12).
C.3 Facilities and Location of Training

Different facilities may be required and it is important to make sure that these are available:

**Administration arrangements** appropriate for enrolment and certification of delegates and all aspects of the delivery of training in accordance with this standard

**Theory training area(s)** designed to enable each delegate to view, hear and participate fully in the subject matter being taught

**All facilities must be maintained and where appropriate, inspected and tested in accordance with current standards/legislation and manufacturers’ guidelines**

**Location of Training**

It is recognised that the restricted range of resources and facilities required makes this course suitable for on-location training. However, prior to any courses being delivered remotely, training providers must comply with the following requirements:

(a) Prior to initial approval, the training provider will specify a single ‘approved site’ and advise OPITO of its intention to deliver training remotely

(b) The training provider will advise OPITO of the location of any remote training in advance of each delivery

(c) The training provider shall ensure the suitability of facilities and arrangements prior to delivery

(d) Documented evidence will be retained by the training provider to show that delivery of training at the remote site meets the criteria detailed in this OPITO standard including, but not limited to, facilities, equipment and qualification of instructional staff

(e) Documented management procedures shall be retained which record any measures required to assure the quality and safety of on location training

(f) All records and associated documentation must be retained at a single, specified location, mutually agreed with OPITO, and made available at time of audit

(g) OPITO reserves the right to physically audit any or all of the remote sites operated by the training provider
C.4 Equipment

Equipment, of a type commonly used in industry, is required to meet the needs of the training programme including:

1. Examples of relevant permits
2. Examples of appropriate PPE
3. Examples of gas detection equipment – portable and personal monitors
4. Operating instructions for the detection equipment

In accordance with requirements of OPITO approval, training providers must ensure that first aid equipment and medical assistance would be available immediately should a delegate be in need of it.

All equipment must be maintained, and where appropriate, inspected and tested in accordance with current standards/legislation, guidance and manufacturers recommendations.
SECTION D  Administration and Certification

D.1  Joining Instructions – Not applicable

D.2  Periodicity

Authorised Gas Testers Level 1 must revalidate their OPITO certificates every **three years**.

**Note:** Some individual companies require re-validation at intervals more frequent than that required by OPITO; in these instances it will be acceptable for training providers to omit or modify the expiry date to avoid confusion. However the validity period will remain as set by OPITO with regard to the central register and the industry as a whole.

D.3  Certification

Training Centres are responsible for issuing a certificate direct to the delegate completing the programme and to the sponsoring company (when required). Each certificate must indicate that the delegate has been assessed against and met the learning outcomes and must contain the following:

(a)  Training Centre name  
(b)  Full OPITO course title stating that it is OPITO-approved  
(c)  OPITO registration code  
(d)  Delegate’s name  
(e)  Course dates  
(f)  Expiry date (Three years minus one day following the date that the delegate successfully completes the course)  
(g)  Unique Certificate Number (UCN) – Refer to [OPITO UCN Guidance doc](#), for details  
(h)  Training Centre Signatory.

The issue of a certificate indicates that the delegate has completed the training successfully such that he/she is ready to join a work team for further installation- specific training and assessment against the competence statements in Section E.
D.4 Course Administration

Each delegate attending any OPITO-approved programme must be registered with the Central Register (CR) operated by OPITO. Registration must be made by the training centre to OPITO within one week following the course.

OPITO confirms that information on the registration form will be contained in a computerised register which will be available to employers, prospective employers and training providers in the oil and gas industry to verify training records. At all times, use of this data will be strictly in accordance with principles laid down in data protection legislation.
SECTION E  COMPETENCE UNITS

E.1  Development of Competence Statements

The competence statements from the Occupational Standard for The Testing for Oxygen, Toxic and Flammable Gases are included in this section.

Using a competence-based approach the following were identified and developed for this role:

(a) What personnel are expected to do
(b) The underpinning knowledge and skills they would require to enable them to do what was expected
(c) How they could demonstrate what was expected of them
(d) How their performance would be assessed

E.2  Competence Assessment levels

AGT Level 1: Personnel undertaking this role will be assessed against the Competence Units 1, 2 & 3.

AGT Level 2: Personnel undertaking this role will be assessed against Competence Units 2 & 3.

AGT Level 3: Personnel undertaking this role will be assessed against Competence Unit 3.

Note: In the workplace, persons undertaking Standby/Safety Watch duties at the entrance to a confined space shall be an AGT Level 1 Gas Tester.
E.3 Competence Units and Elements: Titles

During this work the candidate must take account of the relevant operational requirements and safe working practices – As they apply to the candidate.

The following units and elements apply:

Unit 1 Perform a Test for Oxygen, Flammable and Toxic Gases in Confined Spaces
   Element 1.1 Prepare to carry out a test for oxygen, toxic and flammable gases in confined spaces
   Element 1.2 Complete the gas test for oxygen, toxic and flammable gases in confined spaces

Unit 2 Perform a Test for Flammable Gases in Preparation for Hot Work
   Element 2.1 Prepare to carry out a test for flammable gases in preparation for hot work
   Element 2.2 Complete the gas test for flammable gases

Unit 3 Monitor the Work Area for Flammable Gases
   Element 3.1 Monitor the work area for flammable gases
Unit Wide Knowledge and Understanding

Within the limits of your responsibility you must be able to demonstrate that you know:

a. How to select, use and care for PPE for different toxic and flammable gases - to include both sight and hearing protection, gloves, footwear, hard hats and coveralls

b. The strengths and weaknesses of the various types of atmospheric flammable and toxic gas detection equipment - to include transportable, portable and personal monitors

c. The implications of organisational and statutory requirements

d. The implications of Occupational Exposure Limits for flammable and toxic gases

e. The hazards associated with working within a toxic, flammable or Non-Life supporting atmosphere

f. How to work both with and within the Permit to Work system

g. How to interpret operational requirements - to include policies, procedures, instructions, codes of practice and standards

h. The range and frequency of tests and their acceptable limits

i. The hazards and properties of flammable, toxic and inert gases

j. The principles of gas testing as applied to confined space entry

k. The type of production operation being tested for flammable and toxic gases.
UNIT 1  Perform a Test for Oxygen, Flammable and Toxic Gases in Confined Spaces

ELEMENT 1.1  Prepare to carry out a test for oxygen, toxic and flammable gases in confined spaces

This element is about preparing the worksite for the test and includes identifying the correct gas detector for the area or environment.

Standards of Performance

In achieving this element you will have (in accordance with procedures):

1.1.1 Undertaken a risk assessment with the relevant personnel to identify and confirm all the types of potential gas hazards and their possible locations
1.1.2 Selected, inspected and prepared for use the appropriate oxygen or gas detector(s) in accordance with the relevant instructions
1.1.3 Confirmed the equipment functional and fit for purpose
1.1.4 Identified equipment defects and taken the appropriate remedial action
1.1.5 Confirmed the status of the relevant work permits and authorisations with the relevant personnel
1.1.6 Selected the appropriate documentation for the test and environment
1.1.7 Worked safely in accordance with operational requirements

Scope:

In preparing to carry out a test for oxygen, toxic and flammable gases in confined spaces you must use the following pieces of equipment and/or operations:

a. Personal protective equipment
b. Portable atmospheric monitoring equipment relevant to the test in hand
c. Work permits and authorisation documentation
d. Recording documentation
e. Personal monitoring equipment

Continued…
Element 1.1 Knowledge and Understanding (see also Unit Wide Knowledge and Guidance)

Within the limits of your responsibility you must be able to demonstrate that you know:

a. How to access and interpret the relevant operational instructions.
b. How to produce general risk assessments and how to apply them in the workplace.
c. The hazards and properties of flammable and toxic gases including oxygen deficiency and enrichment, nitrogen and specialist materials appropriate to the location.
d. The different types of detectors used for the relevant application.
e. How to set up the relevant detector for each gas testing application and confirm its correct functioning.
f. How to correctly select between aspirating and non-aspirating detectors to obtain a representative sample of the atmosphere being tested.
g. The operating principles of atmosphere monitoring and measuring equipment including their strengths weaknesses and frequently observed failure modes.
h. The potential cumulative effects of operations within an oxygen deficient, toxic or flammable environment.
i. How to document the results and advise relevant personnel.
ELEMENT 1.2 Complete the gas test for oxygen, toxic and flammable gases in confined spaces

This element is about completing the gas test in accordance with the manufacturer’s and companies requirements.

Standards of Performance

In achieving this element you will have (in accordance with procedures):

1.2.1 Completed the gas test to conform to statutory and organisational requirements
1.2.2 Effectively used equipment in accordance with the relevant instructions
1.2.3 Confirmed the readings were within the specified limits
1.2.4 Identified any deviations and took appropriate action in accordance with work place requirements
1.2.5 Worked safely and in accordance with operational instructions relevant to confined spaces
1.2.6 Accurately recorded the results of the test on the appropriate documentation

Scope:

Whilst completing the test for oxygen, toxic and flammable gases in confined spaces you must use the following:

a. Portable atmospheric monitoring equipment to include oxygen, flammable and toxic gas detectors, including both electrical and chemical stain types
b. Personal monitoring equipment
c. Gas testing techniques to include physical measurements, observation, sampling, records and data assessment
d. Relevant Instructions to include legislation, codes of practice, manufacturers’ and company instructions.

Element 1.2 Knowledge and Understanding (see also Unit Wide Knowledge and Guidance)

Within the limits of your responsibility you must be able to demonstrate that you know:

a. How to interpret the results, to include both normal and abnormal
b. The acceptable levels of flammable and toxic gases and the correct amount of oxygen
c. The behaviour of different gases – to include heavier than air & lighter than air behaviour and “neutral buoyancy” effect
d. Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere
e. How to obtain a representative atmosphere sample from a range of confined spaces.
UNIT 2 Perform a Test for Flammable Gases in Preparation for Hot Work

ELEMENT 2.1 Prepare to carry out a test for flammable gas in preparation for hot work

This element is about preparing the worksite for the test and includes identifying the correct gas detector for the area or environment.

Standards of Performance

In achieving this element you will have (in accordance with procedures):

2.1.1 Undertaken a risk assessment with the relevant personnel to identify and confirm all the types of potential gas hazards and their possible locations
2.1.2 Selected, inspected and prepared for use the appropriate oxygen or gas detector(s) in accordance with the relevant instructions
2.1.3 Confirmed the equipment functional and fit for purpose
2.1.4 Identified equipment defects and taken the appropriate remedial action
2.1.5 Confirmed the status of the relevant work permits and authorisations with the relevant personnel
2.1.6 Selected the appropriate documentation for the test and environment
2.1.7 Worked safely in accordance with operational requirements

Scope:

In preparing to carry out a test for flammable gases you must use the following pieces of equipment and/or operations:

a. Personal protective equipment
b. Portable gas monitoring equipment relevant to the test in hand
c. Work permits and authorization documentation
d. Recording documentation
e. Personal monitoring equipment

Continued…
Element 2.1 Knowledge and Understanding (see also Unit Wide Knowledge and Guidance)

Within the limits of your responsibility you must be able to demonstrate that you know:

a. The hazards and properties of flammable gases including oxygen deficiency and enrichment and specialist materials appropriate to the location.
b. How to produce general risk assessments and how to apply them in the workplace.
c. The operating principles of the different types of detectors used for the flammable product including their strengths, weaknesses and frequently observed failure modes.
d. How to correctly set up the relevant detector for each gas testing application.
e. How to correctly select between aspirating and non-aspirating detectors, relevant to the atmosphere being tested.
f. How to document the results and advise relevant personnel
ELEMENT 2.2 Complete the gas test for flammable gases

This element is about completing the gas test in accordance with the manufacturer’s and companies requirements.

Standards of Performance

In achieving this element you will have (in accordance with procedures):

2.2.1 Completed the gas test to conform to statutory and organisational requirements
2.2.2 Effectively used equipment in accordance with the relevant instructions
2.2.3 Confirmed the readings were within the specified limits
2.2.4 Identified any deviations and took appropriate action in accordance with work place requirements
2.2.5 Worked safely and in accordance with operational instructions relevant to the work area
2.2.6 Accurately recorded the results of the test on the appropriate documentation

Scope:

Whilst completing the test for oxygen, toxic and flammable gases in confined spaces you must use the following:

a. Transportable and portable atmospheric monitoring equipment
b. Personal monitoring equipment
c. Gas testing techniques to include physical measurements, observation, sampling, records and data assessment
d. Relevant Instructions to include legislation, codes of practice, manufacturers’ and company instructions.

Element 2.2 Knowledge and Understanding (see also Unit Wide Knowledge and Guidance)

Within the limits of your responsibility you must be able to demonstrate that you know:

a. The principles of hot work gas testing as applied to the work area
b. How to interpret the results, to include both normal and abnormal
c. The acceptable levels of flammable gases and the correct amount of oxygen
d. The behaviour of different gases – to include heavier than air & lighter than air behaviour and “neutral buoyancy” effect
e. Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere
UNIT 3  Monitor the Work Area for Flammable Gases

ELEMENT 3.1  Monitor the work area for flammable gases

Standards of Performance

In achieving this element you will have (in accordance with procedures):

3.1.1  Accurately sited the equipment for optimum benefits
3.1.2  Monitored the level of gas at intervals as required by the work permit
3.1.3  Effectively and regularly checked the operation of the gas monitor
3.1.4  Identified and reported any deviations to the relevant personnel
3.1.5  Confirmed that the detector / monitor is correctly responsive to a flammable gas atmosphere

Scope:

Whilst monitoring the work area for flammable gases you must use:

a.  Transportable and portable atmospheric monitoring equipment
b.  Personal monitoring equipment

element 3.1 Knowledge and Understanding

Within the limits of your responsibility you must be able to demonstrate that you know:

a.  How to select, use and care for PPE for different toxic and flammable gases - to include both sight and hearing protection, gloves, footwear, hard hats and coveralls
b.  The implications of organisational and statutory requirements - to include Occupational Exposure Limits for flammable gases
c.  How to work both with and within the Permit to Work system
d.  How to access and interpret operational requirements - to include policies, procedures, instructions, codes of practice and standards
e.  The hazards and properties of flammable gases
f.  The type of production operation being tested for flammable gases
g.  The importance of checking the controls on the equipment is as specified
h.  The importance of regular communication
i.  Who to contact if there is a problem you cannot resolve
j.  What documentation needs to be completed
k.  How a flammable gas or vapour clouds could arrive at the hot work site
l.  The behaviour of different gases – to include heavier than air & lighter than air behaviour and “neutral buoyancy” effect.
Glossary of Terms and Abbreviations

AGT  Authorised Gas Tester
LEL  Lower Explosive Limit
PPE  Personal Protective Equipment
PTW  Permit to Work
RPE  Respiratory Protective Equipment
UEL  Upper Explosive Limit
WEL  Workplace Exposure Limits

Appendix 1 OPITO Information

The topics listed below are to be delivered as part of the introduction to this course and included in the Lesson Plans/Instructor guides/Exercise Plans. Additional introduction topics may include training centre layout and alarms, emergency actions, first aid and domestic arrangements

Mandatory OPITO Information:

a) Medical Fitness
b) Certification Periods
c) CR/Vantage (provided by OPITO)
d) OPITO Customer Service Statement (provided by OPITO)
e) The roles of employers and training providers (provided by OPITO)
f) What is OPITO’s role in industry? (provided by OPITO)
g) Current Global Network of training providers (provided by OPITO)
h) Emergency Response Framework (provided by OPITO – applicable for ER Training Providers)
i) OPITO DVD (BOSIET/TBOSIET only) provided by OPITO
Appendix 2  Computer Based Learning Packages

This section sets out the principle criteria for the design and presentation of the Computer Based Learning packages.

Programme Design

The design of the programme should ensure the package is interactive and engaging for the learner. There must be a clear navigation system which ensures that the delegate is at ease with the learning technology and the programme should assume the learner has little or no computer experience.

Screen text should be limited to summarising and for bullet points. Prompts should be included in the programme to alert the learner to the need for regular breaks about every 20 minutes.

CBT Equipment

Trained facilitators should be accessible at remote locations to correct simple faults with the learning package and the hardware.

On site learning should take place on dedicated equipment in a location suitable for the purpose.

Continued…
The CBT Training Process

(a) Questions must be pre-tested internally by the organisation and externally (by OPITO). The training should include continuous assessment by module/topic and a final end of course.

(b) Continuous evaluations should be included for the learner to check their progress and give the opportunity to revisit sections of the learning package if unsuccessful. These evaluations should not be included in the final result.

(c) The questions must be selected on a random basis to prevent delegates obtaining pre-knowledge of them.

(d) The question methodology should be varied to suit the subject and be engaging. Typical examples to use are multiple choice, drag and drop, complete the question and scenario completion.

(e) The package should provide feedback to the learner on incorrect answers and alert the learner to the likely result.

(f) Evaluation data from previous learners should be stored in ‘hidden files’ only accessed by the learning package moderator.

(g) Completed evaluations should be internally verified at a central location to ensure the training has been completed and the evaluations are valid and reliable. Records of this verification process should be retained for two years.

Certificates should only be issued after completion of these checks.
Appendix 3 Guidance for Delivering Combined AGT (Levels 1,2,3) Course

The following matrices provide further guidance on delivery of the combined AGT Levels 1-3 course (both initial and further training) by identifying commonalities across all three standards and are aimed to be used as a guidance tool when developing lesson plans for the combined AGT course. 1) Table 1 lists the learning outcomes that appear across the three AGT Initial Training standards (reference section A.5 Learning Outcomes). Learning outcomes that are shared across all three standards are identified below.

<table>
<thead>
<tr>
<th>Learning Outcomes across AGT Levels 1,2,3 (initial) – Section A.5</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confined space criteria</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hazards of operating within an oxygen deficient, toxic or flammable environment</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carrying out a suitable and sufficient risk assessment (TBRA) or (KBRA)</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Using safe systems of work</td>
<td>4</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>The implications of organisational and statutory requirements</td>
<td>5</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Interpreting operational requirements</td>
<td>6</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>How to select, use and care for PPE and RPE</td>
<td>8</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Working within the Permit To Work system</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The operating principles of atmosphere monitoring and measuring equipment</td>
<td>11</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>Calibrating the instruments used in atmospheric testing</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to set up the relevant detectors for each gas testing application</td>
<td>13</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>The behaviour of different flammable and toxic gasses</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The range and frequency of tests</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable levels of flammable and toxic gasses</td>
<td>17</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Performing gas tests in sequence</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtaining a representative atmosphere sample</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitoring and retesting</td>
<td>21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere</td>
<td>22</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>Interpreting and documenting the results</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hot work and the production of flammable and toxic gasses</td>
<td>25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The principles of hot work gas testing</td>
<td>26</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hazards and properties of flammable gasses</td>
<td>27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The strengths and weaknesses of flammable and toxic gas detection equipment</td>
<td>28</td>
<td>29</td>
<td></td>
</tr>
<tr>
<td>Detectors used for flammable product</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How a flammable gas or vapour clouds could arrive at the work site</td>
<td>31</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>Checking the controls on the equipment</td>
<td>33</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The importance of regular communication</td>
<td>34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completing the relevant documentation</td>
<td>35</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Cross mapping of learning outcomes across AGT Levels 1,2,3 (initial)
Table 2 lists the training elements that appear across two or all three AGT Initial Training standards (reference section A.8 Training Programme).

<table>
<thead>
<tr>
<th>Shared Training Elements across AGT Levels 1,2,3 (initial) – section A.8</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>The type of production operation being tested for flammable and toxic gases</td>
<td>1.1.2</td>
<td>1.1.2</td>
<td>1.1.2</td>
</tr>
<tr>
<td>Carrying out a suitable and sufficient risk assessment before testing activities (and confined space entry)</td>
<td>1.1.4</td>
<td>1.1.6</td>
<td></td>
</tr>
<tr>
<td>Using safe systems of work, to include:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(a) Appointment of a supervisor</td>
<td>1.1.5(a)</td>
<td>1.1.7(a)</td>
<td></td>
</tr>
<tr>
<td>(d) Testing and continuous monitoring of the air</td>
<td>1.1.5(d)</td>
<td>1.1.7(c)</td>
<td></td>
</tr>
<tr>
<td>(e) Communications</td>
<td>1.1.5(e)</td>
<td>1.1.7(e)</td>
<td></td>
</tr>
<tr>
<td>Using observers to raise the alarm and initiate emergency response</td>
<td>1.1.6</td>
<td>1.1.8</td>
<td></td>
</tr>
<tr>
<td>The implications of organisational and statutory requirements with respect to gas testing - to include legislation, codes of practice, manufacturers’ and company instructions</td>
<td>1.2.1</td>
<td>1.2.1</td>
<td>1.1.3</td>
</tr>
<tr>
<td>How to interpret operational requirements - to include policies, procedures, instructions, codes of practice and standards</td>
<td>1.2.3</td>
<td>1.2.2</td>
<td>1.1.7</td>
</tr>
<tr>
<td>How to select, use and care for PPE for different toxic and flammable gases through risk assessment</td>
<td>1.2.4</td>
<td>1.2.3</td>
<td>1.1.4</td>
</tr>
<tr>
<td>Consideration of appropriate levels of respiratory protective equipment</td>
<td>1.2.5</td>
<td>1.2.4</td>
<td>1.1.5</td>
</tr>
<tr>
<td>How to work both with and within the Permit to Work system</td>
<td>1.2.6</td>
<td>1.2.5</td>
<td>1.1.6</td>
</tr>
<tr>
<td>How to access and interpret the relevant operational instructions</td>
<td>1.3.1</td>
<td>1.3.1</td>
<td></td>
</tr>
<tr>
<td>The operating principles of atmosphere monitoring and measuring equipment and frequently observed failure modes</td>
<td>1.3.2</td>
<td>1.3.2</td>
<td></td>
</tr>
<tr>
<td>The strengths and weaknesses of the various types of atmospheric flammable and toxic gas detection equipment - to include transportable, portable and personal monitors</td>
<td>1.3.3</td>
<td>1.3.3</td>
<td></td>
</tr>
<tr>
<td>How to correctly select between aspirating and non-aspirating detectors to obtain a representative sample of the atmosphere being tested</td>
<td>1.3.4</td>
<td>1.3.4</td>
<td></td>
</tr>
<tr>
<td>Gas detector pre-start checks</td>
<td>1.3.6</td>
<td>1.3.5</td>
<td></td>
</tr>
<tr>
<td>Calibrating the instruments used in atmospheric testing</td>
<td>1.3.7</td>
<td>1.3.6</td>
<td></td>
</tr>
<tr>
<td>The behaviour of different gases – to include heavier than air &amp; lighter than air behaviour and “neutral buoyancy” effect</td>
<td>1.4.2</td>
<td></td>
<td>1.1.9</td>
</tr>
<tr>
<td>Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere</td>
<td>1.4.13</td>
<td>1.4.3</td>
<td></td>
</tr>
<tr>
<td>How to interpret the results, to include both normal and abnormal</td>
<td>1.5.1</td>
<td>1.5.1</td>
<td></td>
</tr>
<tr>
<td>How to document the results and advise relevant personnel</td>
<td>1.5.2</td>
<td>1.5.2</td>
<td></td>
</tr>
<tr>
<td>Hot work (any operation involving naked flames or producing heat and/or sparks or any operation that has spark potential)</td>
<td>1.1.1</td>
<td>1.1.1</td>
<td></td>
</tr>
<tr>
<td>The type of production operation being tested for flammable and toxic gases</td>
<td>1.1.2</td>
<td>1.1.2</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Cross mapping of training elements shared across AGT Levels 1,2,3 (initial)
3) Table 3 lists the learning outcomes that appear across the three AGT Further Training standards (reference section B.5 Learning Outcomes). Learning outcomes that are shared across all three standards are identified below.

<table>
<thead>
<tr>
<th>Learning Outcomes across AGT Levels 1,2,3 (Further) – Section B.5</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes to equipment design, legislation and certification</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>The operating principles of atmosphere monitoring and measuring equipment</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Gas detector pre-start checks</td>
<td>3</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Calibrating the instruments used in atmospheric testing</td>
<td>4</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>How to set up the relevant detector for each gas testing application</td>
<td>5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>The behaviour of different flammable and toxic gases</td>
<td>6</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>The range and frequency of tests</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acceptable levels of flammable and toxic gases</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Performing gas tests in sequence</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obtaining a representative atmosphere sample</td>
<td>10</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Monitoring and retesting</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where to site portable or transportable equipment that will be used to continuously monitor the atmosphere</td>
<td>12</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>The strengths and weaknesses of flammable and toxic gas detection equipment</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detectors used for the flammable product</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The hazards and properties of flammable gases</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How a flammable gas or vapour clouds could arrive at the hot work site</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Checking the controls on the equipment</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The importance of regular communication</td>
<td></td>
<td></td>
<td>6</td>
</tr>
</tbody>
</table>

Table 3: Cross mapping of learning outcomes across AGT Levels 1,2,3 (further)
4) Table 4 lists the training elements that appear across two or all three AGT Further Training standards (reference section B.8 Training Programme).

<table>
<thead>
<tr>
<th>Shared Training Elements across AGT Levels 1,2,3 (Further) – section B.8</th>
<th>L1</th>
<th>L2</th>
<th>L3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes to equipment design, legislation, certification and, where</td>
<td>2.1.1</td>
<td>2.1.1</td>
<td>2.1.1</td>
</tr>
<tr>
<td>possible, company procedures</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to access and interpret the relevant operational instructions</td>
<td>2.2.1</td>
<td>2.2.1</td>
<td></td>
</tr>
<tr>
<td>The operating principles of atmosphere monitoring and measuring</td>
<td>2.2.2</td>
<td></td>
<td>2.2.2</td>
</tr>
<tr>
<td>equipment and frequently observed failure modes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The strengths and weaknesses of the various types of atmospheric</td>
<td>2.2.3</td>
<td>2.2.3</td>
<td></td>
</tr>
<tr>
<td>flammable and toxic gas detection equipment - to include transportable,</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>portable and personal monitors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How to correctly select between aspirating and non-aspirating detectors</td>
<td>2.2.4</td>
<td></td>
<td>2.2.4</td>
</tr>
<tr>
<td>to obtain a representative sample of the atmosphere being tested</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gas detector pre-start checks</td>
<td>2.2.6</td>
<td>2.2.5</td>
<td></td>
</tr>
<tr>
<td>Calibrating the instruments used in atmospheric testing</td>
<td>2.2.7</td>
<td>2.2.6</td>
<td></td>
</tr>
<tr>
<td>The hazards and properties of flammable and toxic gases</td>
<td>2.3.1</td>
<td></td>
<td>2.2.1</td>
</tr>
<tr>
<td>The behaviour of different gases</td>
<td>2.3.2</td>
<td></td>
<td>2.2.2</td>
</tr>
<tr>
<td>How to set up the relevant detector for each gas testing application,</td>
<td>2.3.6</td>
<td></td>
<td>2.3.2</td>
</tr>
<tr>
<td>its potential failure modes and confirming its correct functioning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where to site portable or transportable equipment that will be used to</td>
<td>2.3.13</td>
<td>2.3.4</td>
<td></td>
</tr>
<tr>
<td>continueous monitor the atmosphere</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4: Cross mapping of training elements shared across AGT Levels 1,2,3 (Further)