

**Approval Conditions
for Operating
Mandatory Safety Training Courses**

Part II – Module 6

Course Design and Specifications

For

(A) Gas Welding Safety Training Course

**(B) Gas Welding Safety Training
Revalidation Course**

Version Control Record

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Inquiry

For further inquiry on matters relating to the application for recognition of the MST courses, please contact:

Occupational Safety Officer (Training)
Occupational Safety and Health Training Centre
Occupational Safety and Health Branch, Labour Department
13/F, KOLOUR • Tsuen Wan I, 68 Chung On Street,
Tsuen Wan, New Territories

Tel.: 2940 7054 or 2940 7807

Fax: 2940 6251 or 2940 7493

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Annex 1 *Qualifications of a Gas Welding Safety Training Course
Trainer*

Annex 2 *Course Contents for Gas Welding Safety Training*

1. Overview

- 1.1 The terms and abbreviations adopted in this module follow those defined in Part I. This module is Part II – 1(a) of the AC which covers 2 gas welding safety training courses, i.e. full course and revalidation course. This module should be read together with Part I of this AC.
- 1.2 Gas welding and flame cutting (“gas welding”) is a hazardous trade process. Gas welding operators in the trade should receive proper gas welding skills training and gas welding safety training to safeguard themselves and others during welding processes. Therefore, the LD has introduced a safety training and certification scheme under the Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation (“the Regulation”), Cap 59AE, to ensure that every worker conducting gas welding (“GW”) in industrial undertaking has undergone appropriate safety training and held valid certificate. In this regard, the CL is empowered by the Regulation to recognise the following safety training courses:
- (A) Gas Welding Safety Training Course (“full course”); and
 - (B) Gas Welding Safety Training Revalidation Course (“revalidation course”).
- 1.3 Procedures for application for course recognition are stipulated in the GN. Applicant who wishes to run full course or revalidation course should submit an application to the CL for course recognition.
- 1.4 Unless stated otherwise, requirements stated in this module are applicable to both full course and revalidation course.
- 1.5 TCP should ensure that the course materials used should comply with the requirements of this module.
- 1.6 The objective of the full course is to provide basic knowledge on occupational safety and health for workers engaged in gas welding

processes. The trainees will be issued with a certificate upon successful completion of the course.

- 1.7 Revalidation course aims to provide refresher training to holders of GW certificates, which are expiring or expired, to enhance or reinforce their occupational safety and health knowledge in connection with gas welding. Upon successful completion of the course, the trainee will be issued with a new certificate.
- 1.8 At the end of full course, the trainees should be able to:
 - 1.8.1 Describe general features of the Factories and Industrial Undertakings Ordinance (“FIUO”) and the Occupational Safety and Health Ordinance (“OSHO”) and their subsidiary legislation in connection with gas welding processes;
 - 1.8.2 Describe common types of hazards, unsafe conditions and unsafe acts relating to gas welding processes;
 - 1.8.3 Define responsibilities of various duty holders in relation to gas welding processes;
 - 1.8.4 Comprehend safety measures and precautions that can be adopted in gas welding processes, including emergency preparedness; and
 - 1.8.5 Describe general safe practices on the use and maintenance of gas welding equipment and personal protective equipment.
- 1.9 At the end of revalidation course, the trainees should be able to:
 - 1.9.1 Describe general features of the FIUO and the OSHO and their subsidiary legislation in connection with gas welding processes;
 - 1.9.2 Describe the typical/alarming accidents (including causes and related preventive measures) associated with gas welding, in particular those occurred during the five years preceding the conduct of the revalidation course; and
 - 1.9.3 Describe new technological advancements and developments in work procedure or equipment usage associated with gas welding, particularly those that occurred during the five years preceding the conduct of the revalidation course.

2. Admission criteria

- 2.1 Full course is run for trainee who does not possess a GW certificate or possess a GW certificate which has expired for more than 3 months.
- 2.2 A TCP should ensure that applicant to be admitted to a revalidation course should, at the time of application, be holding a GW certificate which either will expire within 6 months or has expired for not more than 3 months.
- 2.3 A TCP should ensure that trainee admitted to its full course and revalidation course has attained the age of 18 years.

3. Qualifications of trainer

- 3.1 A TCP should ensure that its trainer on the ***theory session*** of either GW safety training course should at least possess the following:
 - 3.1.1 One of the qualifications from 1 to 3 stipulated in **Annex 1**;
 - 3.1.2 A certificate of gas welding skills training issued by the Vocational Training Council (“VTC”), Construction Industry Council Training Academy (“CICTA”) or equivalent;
 - 3.1.3 A certificate of an acceptable instructional skills training course, such as the certificate course of Basic Instructional Techniques by the Hong Kong Institute of Education or the certificate course of Occupational Safety and Health Trainer by the Occupational Safety and Health Council (“OSHC”) or the certificate course of Effective Site Safety Training and Instructing Techniques Course by CICTA or equivalent; and
 - 3.1.4 2 years working experience relevant to gas welding operation.

- 3.2 A TCP should ensure that its trainer on the ***practical session*** of the full course should at least possess the following:
- 3.2.1 A certificate of gas welding skills training issued by VTC or CICTA or hold a recognized trade testing certificate in gas welding or complete an apprenticeship scheme in welding trade or equivalent;
 - 3.2.2 A certificate of Safety Supervisor Course issued either by OSHC or CICTA or equivalent;
 - 3.2.3 4 years relevant working experience on gas welding operation; and
 - 3.2.4 Sound lecturing, instruction and assessment skills and competent to conduct the course by reason of his/her experience and training.

4. Trainees to trainer ratio

- 4.1 A TCP should ensure that the maximum ratio of trainees to trainer is 40 to 1 for theory session of either GW safety training course and is 20 to 1 for the practical session of full course.

5. Class size

- 5.1 A TCP should ensure that the maximum size of a class is 40 trainees and it is the same for the full course and the revalidation course.

6. Course duration

- 6.1 A TCP should ensure that the minimum course duration of full course

should be 7 hours (break between half-day sessions or lunch time not included) and it should include a 3-hour theory session with demonstration of gas welding equipment and safety devices, a 3-hour practical session on general safe practices and complete check of equipment, fittings and fixtures, an examination session of 30 minutes and a total of not more than 30 minutes recess time.

- 6.2 A TCP should ensure that the minimum course duration of revalidation course should be 3.5 hours and it should include an examination session of 30 minutes and a total of not more than 15 minutes recess time.

7. Attendance

- 7.1 A TCP should ensure that any trainee who is absent from the theory class for more than 15 minutes for any half-day sessions will be disqualified to attend the examination.

8. Lesson plan

- 8.1 A TCP should devise and submit the lesson plan(s) of course(s) applied for recognition to the CL for approval.

9. Course contents

- 9.1 A TCP should ensure that the course materials used should include all the topics and details stipulated at **Annex 2**. The TCP should also supplement additional materials in accordance with the needs of the trainees and the latest safety information. The course contents should be submitted to the CL for prior approval.

10. Display, demonstration and practising

- 10.1 A TCP should provide suitable and sufficient equipment (including at least a full set of gas welding equipment including gas cylinders with safety devices, connections, blowpipes and nozzles, storage set and a full set of personal protective equipment) for the purpose of display, demonstration or practising.
- 10.2 In the practical session of full course, demonstration on the correct methods and procedures of the use of the above-mentioned equipments are required. A TCP should ensure that every trainee should safely complete the hands-on practice.
- 10.3 Regarding the revalidation course, a TCP should ensure that explanation to the trainees on the correct operating procedures of the gas welding equipments and correct methods of wearing of the personal protective equipment through demonstration is properly conducted.
- 10.4 A TCP should ensure that storage and use of dangerous goods, gas welding equipment and apparatus; discharge of exhaust gases and ventilation of classroom, etc. shall comply with all relevant legislation as administered by various government departments such as Buildings Department, Electrical and Mechanical Services Department, Fire Services Department, Environmental Protection Department, etc.
- 10.5 A TCP Should provide a purpose-designed premises such as a factory unit for practical session of full course having regard to the means of escape, fire prevention, effective natural and artificial ventilation.

11. Examination

- 11.1 The TCP should submit at least 3 sets of examination papers, each consisting of 20 different multiple-choice questions, their model answers and marking schemes to the CL for approval.

- 11.2 A TCP should ensure that every trainee attending the examination should meet the required attendance and the requirement of completing the hands-on practice.
- 11.3 Time allowed for the examination is 30 minutes and the passing mark is 75%.

12. Validity period of certificate

- 12.1 A TCP should ensure that the validity period of GW certificate issued is 5 years.
- 12.2 For full course, validity period of the certificate should be counted from the date when the trainee successfully completes the course.
- 12.3 For revalidation course, validity of the certificate should be counted from the day—
 - 12.3.1 immediately after the expiry date of the current certificate if the revalidation course is successfully completed within 6 months prior to expiry of the current certificate, or
 - 12.3.2 of completing the revalidation course if the revalidation course is successfully completed within 3 months after expiry of the current certificate.

13. Standard certificate format

- 13.1 A TCP should ensure that the front side of the GW certificate should be designed with the required words, in the format as shown in **Figure 1** and according to the specifications below. The reverse side is left to the TCP to include other information as appropriate, which should be commensurate with the purpose of the certificate.

Figure 1: Required Words and Design Format of the Front Side of GW Certificate

氣體焊接安全訓練課程證明書
Certificate for Gas Welding Safety Training Course
工廠及工業經營(氣體焊接及火焰切割)規例
Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation

持證人姓名 Holder's Name
(中文) :
(English) :

編號 Reference No. :

完成課程日期 Date of Course Completion :
(日日/月月/年年年年) (dd/mm/yyyy)

有效期限 Validity Period : 由 From 至 To 止
(日日/月月/年年年年) (dd/mm/yyyy)

本證明書由 [某發證機構] 簽發
Issued by [provider of recognised training course]

此證明書須由持證人擁有及保存。
This certificate is owned and should be kept by the certificate holder.

(not to scale)

- 13.1.1 The certificate should be made of durable materials, either laminated or plastic, and in standard size of 85 mm x 55 mm;
- 13.1.2 A photograph (minimum size of not less than 20 mm x 25 mm) of the trainee should be incorporated into the certificate for easy identification;
- 13.1.3 For laminated card, the corner of the trainee's photo should be stamped with the TCP's company's chop;
- 13.1.4 For plastic card, the trainee's photo should be printed on the card;
- 13.1.5 Unless otherwise specified, information on the certificate should be printed in both Chinese and English;

13.1.6 The certificate should contain the following information:

- The name of certificate, i.e. “氣體焊接安全訓練課程證明書” and “Certificate for Gas Welding Safety Training Course”;
- The empowering legislation, i.e. “工廠及工業經營（氣體焊接及火焰切割）規例” and “Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation”;
- The Chinese and English name as printed on the Hong Kong Identity Card (or equivalent identity documents) of the certificate holder;
- Reference number of the certificate (an “R” should be appended to the last digit of the reference number to denote that the certificate is issued for a revalidation course);
- Date of Course Completion (in the format of DD/MM/YYYY);
- Validity period with starting date and expiry date (in the format of DD/MM/YYYY);
- Name of the certificate issuing course provider; and
- The wordings of “此證明書須由持證人擁有及保存。” and “This certificate is owned and should be kept by the certificate holder.”

14. Training records

14.1 A TCP should submit the record of every certificate issued according to the required details stipulated in Table 1 as well as the name of the course.

Table 1 : Example of Training Records

HKID/ Passport No. (TRT1)	Name of trainee (TRT2)	Class Ref. (TRC1)	Name of Trainer (TRC2)	Date of Course completion (TRC3)	Certificate Effective Date (TRT3)	Certificate Expiry Date (TRT4)	Certificate Serial No. (TRT5)
A123456(1)	Chan Siu On	ABC1	HAU To-si	13/06/2011	13/06/2011	12/06/2016	W396000201R
A123457(2)	Chan Siu Chuen	ABC1	HAU To-si	13/06/2011	23/09/2011	22/09/2016	W396000202R
A123458(3)	Chan Siu Feng	ABC2	HAU To-si	18/06/2011	18/06/2011	17/06/2016	W396000203
A123459(4)	Chan Siu Lin	ABC2	HAU To-si	18/06/2011	18/06/2011	17/06/2016	W396000204

Annex 1

Qualifications of a Gas Welding Safety Training Course Trainer

Qualifications			
1.	A Registered Safety Officer under the Factories and Industrial Undertakings (Safety Officers and Safety Supervisors) Regulations; or		
2.	A person possessing at least any one of the following qualifications and experience from (i) to (iv); or		
	Academic Qualifications	Experience	
	i. A recognised degree or post-graduate diploma in occupational safety and health, or equivalent.	A cumulative total of <u>not less than one year</u> of experience directly involving occupational safety and health related work.	or
	ii. A degree in Science or Engineering, or equivalent, and a recognised certificate, diploma or higher diploma in occupational safety and health.	A cumulative total of <u>not less than one year</u> of experience directly involving occupational safety and health related work.	or
	iii. A recognised certificate, diploma or higher diploma in occupational safety and health.	A cumulative total of <u>not less than two years</u> of experience directly involving occupational safety and health related work, <u>one year</u> of such experience must be obtained after the academic qualification on the left column.	or
	iv. A recognised certificate in construction safety.	A cumulative total of <u>not less than two years</u> of experience directly involving occupational safety and health related work, <u>one year</u> of such experience must be obtained after the academic qualification on the left column.	
3.	A person recognised by the CL as being competent to teach training course of MBST (Construction Work).		

Course Contents for Gas Welding Safety Training

(A) Full Course

1. Overview of legislation in connection with gas welding safety such as:

- Sections 6A and 6B of the FIUO concerning the general duties of proprietors and employees;
- OSHO on the responsibilities for safety and health at work of employers and employees;
- Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation
- Factories and Industrial Undertakings (Confined Spaces) Regulation;
- Construction Sites (Safety) Regulations;
- Factories and Industrial Undertakings (Fire Precautions in Notifiable Workplaces) Regulations;
- Factories and Industrial Undertakings (Protection of Eyes) Regulations;
- Factories and Industrial Undertakings (Dangerous Substances) Regulations;
- Relevant Codes of Practice, such as Gas Welding and Flame Cutting, Manual Electric Arc Welding, Confined Spaces, Industrial Diving, Lift and Escalator, Use and Operation of Suspended Working Platforms, Use of Mobile Cranes and Tower Cranes;
- Dangerous Goods Ordinance etc.; and
- Any other applicable safety legislation.

2. Overview of common types of hazards, unsafe conditions and unsafe acts, including:

- Fire and explosion resulting from the release of flammable gases to the atmosphere from leaks at joints, hose connections or fittings, or inside equipment caused by a flashback from the blowpipe;
- Fire and explosion resulting from the application of grease or lubricant to the cylinder valve of oxygen cylinder for the purpose

of testing leakage of oxygen;

- Fire and explosion in confined spaces resulting from spark or flame inside a flammable atmosphere;
- Fire arising from the ignition of combustible or flammable substances in the immediate vicinity of gas welding operation;
- Burns from hot slag or hot surfaces;
- Eye injuries, skin irritation and reddening due to over exposure to radiation;
- Inhalation of fumes or gases produced during the process;
- Hazards associated with mechanical handling and conveyance of gas cylinders;
- Personal injuries due to manual handling of gas cylinders or large work pieces;
- Unsafe acts such as misuse of oxygen, gas decanting and warming up of gas cylinders; and
- Improper use of personal protective equipment.

3. Understanding the responsibilities of various duty holders connected with gas welding process:

- The responsibilities of proprietors and contractors in providing a safe system of work, safe plant and safe place of work in connection with gas welding;
- The responsibilities of line management in administering, supervising and monitoring the designed system, plant and equipment as well as the execution of the safe system of work; and
- The responsibilities of gas welding operators and workers such as familiarization of the safe system of work, pre-work checking of equipment, proper use of tools and personal protective equipment, duties to take care of themselves and others, reporting to management of dangers and defects, injuries, incidents at work.

4. Familiarizing with safety measures and precautions of various types of gas welding processes, including:

- Permit-to-work system;
- Safe practices during and after welding and cutting;

- Ventilation of the workplace;
- Fire prevention and protection measures including removal of any combustible materials from the vicinity of the work, installation of fire fighting appliance;
- Equipment of gas welding such as features of gas cylinders, pressure regulators and gauges, hoses, hose connections and hose assemblies, blowpipes, safety devices such as flashback arrestors, non return valves and pressure relief valves, fully automatic gas cutting system etc.;
- Detailed procedures if there is a sustained backfire in a blowpipe or flashback into the hose and equipment;
- Description of emergency procedures;
- Evaluation of conditions to stop work and move to a safe location; and
- Determination to fully evacuate the workplace.

5. Familiarizing with general safe practices, use and maintenance of gas welding equipment and personal protective equipment:

- Proper storage of cylinders, supply system, transportation and use of cylinders;
- Preparation before commencement of gas welding such as checking all the correct items of equipment are available for use, all safety devices are fitted and all equipment are in good working order, the condition of the workplace for fire and explosion;
- Safety precautions for gas welding in confined spaces such as inside lift shafts, oil tanks or underground tunnels etc.;
- General examination and maintenance of equipment in accordance with the instructions in the operation and maintenance manual of a supply system, routine check on fittings and fixtures of gas welding facilities;
- Response to possible emergency situations; and
- Introduction of personal protective equipment (“PPE”) such as eye protection, fall protection, clothing, gloves, safety shoes, etc. and description on how to demonstrate the correct use of these PPE.

(B) Revalidation course

1. Overview of legislation in connection with gas welding safety such as:

- Sections 6A and 6B of the FIUO concerning the general duties of proprietors and employees;
- OSHO on the responsibilities for safety and health at work of employers and employees;
- Factories and Industrial Undertakings (Gas Welding and Flame Cutting) Regulation
- Factories and Industrial Undertakings (Confined Spaces) Regulation;
- Construction Sites (Safety) Regulations;
- Factories and Industrial Undertakings (Fire Precautions in Notifiable Workplaces) Regulations;
- Factories and Industrial Undertakings (Protection of Eyes) Regulations;
- Factories and Industrial Undertakings (Dangerous Substances) Regulations;
- Relevant Codes of Practice, such as Gas Welding and Flame Cutting, Manual Electric Arc Welding, Confined Spaces, Industrial Diving, Lift and Escalator, Use and Operation of Suspended Working Platforms, Use of Mobile Cranes and Tower Cranes;
- Dangerous Goods Ordinance etc.; and
- Any other applicable safety legislation.

2. Brief review of typical/alarming accidents (including causes and related preventive measures) associated with gas welding, in particular those occurred during the five years preceding the conduct of the course.

3. Brief review of new technological advancements and developments in work procedure or equipment usage associated with gas welding, particularly those that occurred during the five years preceding the conduct of the course.

4. Introduction of personal protective equipment (“PPE”) such as eye protection, fall protection, clothing, gloves, safety shoes, etc. and description on how to demonstrate the correct use of these PPE.