

# GUIDE AND SYLLABUS FOR EXAMINATION OF CERTIFICATE OF COMPETENCY

ISSUED UNDER THE BOILERS AND PRESSURE VESSELS ORDINANCE CAP. 56



Occupational Safety and Health Branch  
Labour Department

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CERTIFICATE OF COMPETENCY**

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ORDINANCE**

Chapter 56



Boilers and Pressure Vessels Authority  
Hong Kong

2002 Edition

## ***Introduction***

This guide and syllabus is intended to assist any person who desires to obtain a Certificate of Competency issued under section 6 of the Boilers and Pressure Vessels Ordinance (the "Ordinance"), Chapter 56 of the Laws of Hong Kong. The Boilers and Pressure Vessels Division of the Occupational Safety and Health Branch of the Labour Department, Hong Kong Special Administrative Region Government, administers the Ordinance on behalf of the Commissioner for Labour (the 'Authority') by ensuring the safe use and operation of all equipment covered by the Ordinance.

1. The Ordinance (section 49(7)) prohibits the operation of any boiler or steam receiver unless it is under the *direct supervision* of a competent person, whose Certificate of Competency states that the holder is competent to operate –
  - (a) all classes or types of boiler and steam receiver; or
  - (b) boilers or steam receivers of the class or type in question.
  
2. The Authority may, upon application in writing and payment of the prescribed application fee, issue a Certificate of Competency to a person or endorse an existing Certificate of Competency if that person (section 6(1)) –
  - (a) has produced evidence that satisfies the Authority that he/she has adequate experience, skill and knowledge in the operation of all classes and types of boiler and steam receiver or of boilers or steam receivers, or both, of

the class or type to be specified in the certificate, as the case may be; OR

(b) has, by passing an examination conducted by the Authority, satisfied the Authority that he/she has adequate experience, skill and knowledge in the operation of all classes and types of boiler and steam receiver or of boilers or steam receivers, or both, of the class or type to be specified in the certificate, as the case may be.

3. Any applicant who wishes to sit for the examination for the issue of a Certificate of Competency (section 6 (1)(b)) should be not less than 18 years of age.
4. An applicant who has attended an Approved Training Course and passed the final examination, will be considered as fulfilled the ‘skill and knowledge’ requirement specified in paragraph 2(a) above.

### ***Qualifying service for Certificate of Competency***

5. The various periods of qualifying service for the issue or endorsement <sup>note 1</sup> of a Certificate of Competency in respect of the classes of equipment enumerated in paragraph 15 are as follows:
  - (a) *All Classes - valid for all types of boilers and steam receivers*, 12 MONTHS, of which at least 6 months must have been spent operating a water-tube type boiler with superheater and at least 3 months operating a fire-

tube type boiler and the rest operating any other type of boiler.

- (b) *Class I – valid for all water-tube boilers and steam receivers, 9 MONTHS, of which at least 6 months must have been spent operating a water-tube type boiler with superheater and the rest on any other type of boiler.*
- (c) *Class I(A), I(B), II, II(A), II(B) or III – valid for the type of boiler specified and steam receivers, 9 MONTHS, of which at least 6 months must have been spent operating the type of boiler specified in the particular class of equipment for which the certificate is required and the rest on any other type.*
- (d) *Class III(A), IV or V – valid for the type of boiler specified, 6 MONTHS, the whole of which must have been spent operating the type of boiler specified in the particular class of equipment for which the certificate is required.*
- (e) *Class VI – valid for steam receivers only, 1 MONTH, the whole of which must have been spent operating a steam receiver.*

**Note 1:** A holder of a Certificate of Competency for a particular class of equipment may, upon having completed the minimum period of qualifying service for another class of equipment, apply for Endorsement Examination. If successful, the candidate's Certificate of Competency will be endorsed accordingly.

## *Application for examination*

6. An applicant who desires to sit the examination for the issue or endorsement of a Certificate of Competency can obtain an Application Form (LD 135) from the Boilers and Pressure Vessels Division at:

24/F., Western Harbour Centre,  
181 Connaught Road West,  
Western District,  
Hong Kong.  
Tel.: 2975 6428  
Fax: 2517 6853

Alternatively, a copy of Application Form is also obtainable through the Telephone Enquiry Service of Labour Department at 2717 1771. Applicant should fill in the required particulars, obtain the signature(s) of his/her employer(s) and the company's chop for certifying the applicant's experience. The applicant should NOT sign on the Application Form until advised to do so in the presence of the Assessor.

**Note:** If the employer does not sign, then an alternative satisfactory testimonial must be produced in support of the applicant's experience.

7. The applicant may choose written or oral examination to be conducted in either English or Chinese. He/She should indicate his/her preference on the Application Form.

8. The applicant should present, IN PERSON, with his/her Identity Card, completed Application Form and three recent passport type (40 x 50 mm) photographs to the Examination Clerk of the Boilers and Pressure Vessels Division, Labour Department. If the application is found in order, the applicant can sign on the Application Form and a General Demand Note (GF188A) will be issued for payment. He/She should pay the prescribed application fee by following the payment instructions provided in the General Demand Note. He/She will be informed of the time, date and room for his/her examination by the Examination Clerk.

### ***Conduct of examination***

9. On the date of the examination, all candidates shall appear before the Assessor punctually. A candidate who arrives late after the first 30 minutes of either an oral or written examination session, can still be admitted to the examination room, but the Assessor will be required to complete a report stating the time of admission, and the reason given by the candidate for his/her lateness. All candidates are required to comply with the Examination Rules as promulgated by the Authority. If, during the examination, a candidate is discovered in breach of any of the Examination Rules or in the use of any unfair means, the facts will be reported to the Authority who will decide on the action to be taken.

10. A candidate who is unable to attend an examination can either request for a refund of his/her application fee or request for a postponement of his/her examination. A request for refund or postponement **MUST** be made not less than 2 days before the examination date and must be in writing. In the case of a postponement, a new examination date will be confirmed in writing by the Authority to the candidate. In any case, only one postponement of an examination will be permitted.

### ***Examination result & review***

11. Candidates will be required to obtain an overall score of not less than 50% marks in the examination. A candidate who passes the examination will be notified by the Examination Clerk of the time and date for him/her to collect his/her Certificate of Competency.
12. A candidate may, within 28 days of being notified of his/her examination result, request in writing the Authority to review the result (section 6(7)). The Authority will notify in writing the candidate of its decision within 28 days after the completion of the review (section 6(8)).

## *Approved Training Courses*

13. An applicant who has attended one of the following Approved Training Courses and passed the final examination, will be considered as having fulfilled the ‘skill and knowledge’ requirement as specified in section 6(1)(a) of the Ordinance. Certificate of Competence may be issued after fulfillment of the qualifying service requirement as specified in paragraph 5 above. For details, please refer to the Examination Clerk of the Division.

- (a) Occupational Safety and Health Council  
18/F., China United Centre,  
28 Marble Road, North Point,  
Hong Kong.  
Tel : 2311 3322 E-mail: [trg@oshc.org.hk](mailto:trg@oshc.org.hk)  
<http://www.oshc.org.hk>
  
- (b) Hong Kong Institute of Vocational Education,  
Haking Wong Campus,  
702 Lai Chi Kok Road,  
Kowloon.  
Tel: 2361 5161 (Extension 221)

## *Appeals related to Certificate of Competency*

14. For the issuance of a Certificate of Competency, the Authority has to be satisfied that the applicant possesses adequate experience, skill and knowledge in the operation of boiler and/or steam receiver (section 6(1) (a) & 6(3A)(a)). Furthermore, the Authority may revoke or amend a Certificate of Competency if it ceases to be satisfied that the holder of the Certificate has adequate skill or knowledge in the operation of classes and types of boiler and/or steam receiver specified in the certificate (section 6 (4)). Any person aggrieved by these decisions may, within 28 days of being notified of the decision, appeal to the Administrative Appeals Board (section 6(10)).

## *Class of Certificate & Examination Syllabus*

15. The types of certificate which are valid and the items in the syllabus relevant to the types of certificate and on which candidates may be examined are as follows:

<i>Class of Equipment</i>	<i>Type of Boiler/Steam Receiver For which Certificate Valid</i>	<i>Items in Syllabus on which candidate may be examined</i>
All Classes (I to VI)	All Boilers (including automatically controlled with superheaters) and Steam Receivers	Items (1) to (23) inclusive
Class I	All Water-tube Boilers (including automatically controlled with superheaters) and Steam Receivers	Items (1) to (23), excepting (17) and (18)
Class I(A)	Water-tube Boilers (including automatically controlled but without superheaters) and Steam Receivers	Items (1) to (23), excepting (17), (18) and (20)
Class I(B)	Manually Controlled Water-tube Boilers (without superheaters) and Steam Receivers	Items (1) to (23), excepting (17) to (20)
Class II	All Fire-tube boilers (including automatically controlled) and Steam Receivers	Items (1) to (23), excepting (7), (8) and (20)
Class II(A)	Automatic Fire-tube Boilers and Steam Receivers	Items (1) to (23), excepting (7), (8) and (20)
Class II(B)	Manually Controlled Fire-tube Boilers and Steam Receivers	Items (1) to (23), excepting (7), (8), (19) and (20)

<i>Class of Equipment</i>	<i>Type of Boiler/Steam Receiver For which Certificate Valid</i>	<i>Items in Syllabus on which candidate may be examined</i>
Class III	All Electrically Heated Boilers (including automatically controlled) and Steam Receivers	Items (1) to (6), (10), (12), (14), (16), (17), (19), (21) and (22)
Class III(A)	Manually Controlled Electrically Heated Boilers	Items (1) to (6),(10), (12), (14), (16), (17), (21) and (22)
Class IV	Sterilizing and Vulcanizing Boilers	Items (1) to (5), (10), (12), (14), (16), (17), (19), (21) and (22).
Class V	Special Purpose Boilers as specified	Selected items depending on the type of boiler
Class VI	Steam Receivers	Items (1) to (5) and (22)

## *Syllabus of Examination*

16. The following are the syllabuses of examinations. For further information and enquiry about the syllabus, please contact the Boilers and Pressure Vessels Division, Labour Department.

- (1) The principles involved in the operation of and the use, management and constructional details of the fittings of boilers and steam receivers. Precautions to be taken before entering a boiler or a steam receiver.
- (2) The operation of stop valves and drain valves with particular reference to the danger arising from water hammer action.
- (3) Constructional details and operation of steam receivers which are used for containing steam under pressure greater than atmospheric pressure. Preparation for cleaning, inspection and putting back a steam receiver into service.
- (4) Methods used to verify the indications of a water level gauge and action to be taken in the event of shortage of water.
- (5) Measures adopted to prevent contamination of boiler feed water. The possible sources of the different contaminating agents.

- (6) Method of controlling boiler water composition. Tests required and typical figures for boiler water. Methods of sampling water and interpretation of results. Application of routine treatment. Effects of scale, corrosion, deposits, pitting and incrustation on boiler surfaces.
- (7) Constructional details and management of the different designs of water tube boilers. The arrangement and purpose of their fittings and mountings.
- (8) Arrangement of a water tube boiler feed system and the principles of controls.
- (9) Care and maintenance of furnace refractories.
- (10) Action to be taken in the event of abnormal conditions arising in a boiler.
- (11) Constructional details and management of oil fuel combustion equipment, including forced and induced draught systems.
- (12) Precautions to take when using solid or pulverized fuel, gas, electric or any other means of combustion.
- (13) Routine operation and maintenance to prevent excessive deposits of soot or moisture in air heaters, economizers and boilers.
- (14) Preparation required before (i) laying up a boiler, and (ii) putting back into service a boiler after cleaning or repairs.

- (15) Precautions to be taken with combustible materials. The dangers of (i) entering an oil tank which has previously held oil, and (ii) oil leakage from tanks and other appliances, particularly in unventilated places.
- (16) Method of operating the fire fighting arrangements, appliances and equipment normally available in a boiler house, and the use of other resources in fighting fires which may occur in a boiler house, air heater, uptake or furnace fronts. Why and under what circumstances should different types of fire extinguishing appliances be used.
- (17) Constructional details and management of the various types of boiler, other than the water tube type. The construction and purpose of their mountings and fittings with special reference to water level gauges and safety valves. The arrangement and operation of pumps and other apparatus incorporated in any boiler feed systems used for such boilers.
- (18) The dangers of, and measures to prevent overheating of furnace crowns, combustion chamber tops, fire tubes and uptakes. Action to take if overheating is indicated, such as the distortion of a furnace.
- (19) The function, method of operation and testing of equipment and fittings of an automatically controlled boiler.

- (20) Special attention required to be given to superheaters, economizers and air heaters fitted to water-tube boilers:
  - (i) before the boiler is put into service, and
  - (ii) while the boiler is in operation.
- (21) Particular attention required in the case of electrical equipment associated with boilers. Precautions and safety measures to be taken in the event of abnormal conditions arising.
- (22) The International System of Units (SI). Basic concept of the new system, including conversion from Imperial to SI metric units and their practical application in respect of boilers and pressure vessels, e.g. pressure, temperature, etc.
- (23) The principles involved in the operation of the use, management, and constructional details of the fittings of Thermal Oil Heater, i.e. a pressure vessel in which oil is heated, at a pressure greater than atmospheric pressure, for use as a heat transfer medium.