



the pressure equipment safety authority

REFERENCE SYLLABUS

For

SPECIAL REINSTATEMENT EXAMINATION FOR EXPIRED 1ST, 2ND, 3RD, 4TH, AND 5TH CLASS POWER ENGINEER'S CERTIFICATE

AB-50

Edition 1, Revision 2, 2018-05



**REFERENCE SYLLABUS
For
REINSTATEMENT OF POWER ENGINEER'S
CERTIFICATE of COMPETENCY
EXAMINATION**

REINSTATEMENT EXAMINATION

Introduction:

This Syllabus is intended to aid you in studying for the Special Examination required to reinstate or upgrade your Certificate of Competency.

The materials covered in this syllabus may be found in the Power Engineering Course material offered through an Alberta technical institute and in the various publications listed in the "Reference Material for Power Engineering Students and Examination Candidates" which may be obtained from various technical institutes.

Application to Undertake Examination:

Please submit a completed application form (AB-66), along with the proper examination scheduling fee to the Examination and Certification staff at ABSA.

Examination Instructions:

You will be advised which one of the following examinations you will be required to write.

Exceeding 3 years but less than 5 years

Must write a special competency examination. (25 question on Alberta legislation). The examination of 25 questions consists of one (1) examination paper with 25 multiple-choice questions, 1 hour duration.

Exceeding 5 years or more

Must write a special competency examination. (25 questions on legislation and 25 questions on basic operation). The examination of 50 questions consists of one (1) examination paper with 50 multiple-choice questions, 2 hour duration.

To pass a Special Reinstatement Certificate of Competency examination, a candidate must obtain at least 65% of the total marks for each examination paper.

Note: Only two attempts are allowed to pass the special examination. After two failures, the candidate will be required to successfully challenge all the standardized examination papers for the class of certification.



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GENERAL INFORMATION

A candidate is allowed to use the following items in the examination room:

- The Safety Codes Act and Regulations under the Safety Codes Act;
- CSA B51, Boiler, Pressure Vessel and Pressure Piping Code;
- CSA B52, Mechanical Refrigeration Code;
- Extract for CSA B51 and CSA B52 Codes;
- ASME Boiler & Pressure Vessel Codes except for Sections VI and VII;
- The 2007ASME Boiler & Pressure Vessel Code Academic Extract and Supplement produced by PanGlobal Training Systems;
- ASME/ANSI B31.1 Pressure Piping Code and B31.3 Process Piping Code;
- Handbook of Formulae and Physical Constants, Steam Tables and Refrigeration Tables are normally provided;
- A non-technical English language dictionary;
- Pens and pencils;
- Non-programmable calculator and
- Drawing instruments and drawing templates.

Note:

- The candidate must provide picture ID to the Examiner prior to the examination.
- No cell phone or any electronic communication devices are allowed to be brought into the examination room.
- The items referenced above must be shown to the examiner for approval.
- No other reference material is allowed.
- The information in the 1983 Edition of the ASME Boiler and Pressure Vessel Code Academic Extract is outdated. Using this 1983 Edition of the ASME Extract for any power engineering examination is not recommended. Besides using the 2007 Edition of the ASME Academic Extract and Supplement, candidates may use the current edition of the ASME Code.



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REINSTATEMENT EXAMINATION

- a) Thorough knowledge of Industrial Legislation:
 - i. The Alberta Safety Codes Act
 - ii. Power Engineers Regulation and Supervision Scope of Practice Tables
 - iii. Pressure Equipment Safety Regulation

- b) Fuels and Combustion
 - i. Requirements for efficient combustion of boiler fuels: complete and incomplete combustion.
 - ii. Classification, properties and combustion characteristics of coal, fuel oil, natural gas and other (non-fossil) fuels.
 - iii. Control of emission standards: NO_x, SO₂ and flue gas particulates.

- c) Boiler Construction, Operation and Maintenance:
 - i. Firetube and Watertube details and methods of construction.
 - ii. Starting up and shutting down.
 - iii. Routine and emergency operations.
 - iv. Causes and prevention of boiler furnace explosions and pressure explosions.
 - v. Chemical and mechanical boiler cleaning methods, boiling out a new boiler.
 - vi. Methods of cleaning and preparing a boiler for inspection.
 - vii. Inspection: fire and water sides, safety precautions.
 - viii. Hydrostatic test.

- d) Boiler Fittings:

Thorough knowledge of all boiler fittings including the following:

 - i. Construction, installation, operation and testing of the water gauge and water column.
 - ii. Construction, installation, operation, testing, and setting of the safety valves.
 - iii. Construction, installation, operation and testing of the low-water fuel cut-off.
 - iv. Pressure gauges; feedwater connections; stop, vent, water gauge and blowdown valves; blowdown tank.

GENERAL INFORMATION

- e) Boiler Control Systems:
 - i. Feedwater control: single, two and three element feedwater regulator.
 - ii. Combustion control: safety devices and interlocks, flame failure detection.

- f) Feedwater Treatment and Systems:
 - i. Internal feedwater treatment and testing.
 - ii. External feedwater treatment.
 - iii. Knowledge and control of: pH, sludge, scale, blowdown and corrosion.