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NATIONAL INSTITUTE FOR THE UNIFORM LICENSING OF POWER ENGINEERS, INC.
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REFERENCE SYLLABUS

For

HVAC Plant Operator (1st Class)



HVAC PLANT OPERATOR (1ST CLASS)

SYLLABUS

Introduction

This Syllabus is intended to assist candidates studying for the HVAC Plant Operator (1st Class) Examination.

Recommended Study Program:

It is recommended that, before undertaking this examination, the candidate completes Power Engineering Course of study, offered through a recognized and approved technical institute or training provider which addresses the Syllabus Outline.



HVAC PLANT OPERATOR (1ST CLASS)

SYLLABUS

Reference Syllabus for HVAC Plant Operator (1st Class) Examination Candidates

Major Topic: Heating Boilers

Topic 1 Cast Iron Sectional and Modular Boilers

Topic 2 Oil Burners for Heating Boilers

Topic 3 Gas Burners for Heating Boilers

Topic 4 Basic Fittings for Low Pressure Steam Boilers

Topic 5 Basic Fittings for Hot Water Boilers

Topic 6 Hot Water and Steam Heating Boiler Operation

Major Topic: Steam and Water Heating Systems

Topic 7 Steam Heating Equipment

Topic 8 Steam Heating Systems

Topic 9 Hot Water Heating Systems

Topic 10 Hot Water Heating System Equipment and Operation

Topic 11 Warm Air Heating System Equipment

Topic 12 Warm Air Furnace Components and Maintenance

Topic 13 Ventilation and Air Filters

Topic 14 Infrared and Electric Heating

Major Topic: Heating Boiler and Heating System Controls

Topic 15 Heating Boiler Feedwater Controls

Topic 16 Heating Boiler Operating Controls

Topic 17 Heating Boiler Combustion Controls

Topic 18 Pneumatic Controls for Heating Systems

Topic 19 Electric Controls for Heating Systems

Topic 20 Electronic Controls for Heating Systems

Major Topic: Auxiliary Building Systems

Topic 21 Lighting Systems

Topic 22 Building Water Supply Systems

Topic 23 Sanitary Drainage Systems



HVAC PLANT OPERATOR (1ST CLASS)

SYLLABUS

Major Topic: Air Conditioning

Topic 24 Psychrometric Properties of Air

Topic 25 Application of the Psychrometric Chart

Topic 26 Fans for Air Distribution Systems

Topic 27 Air Conditioning Duct Systems

Topic 28 Coil Types

Topic 29 Coil Operation

Topic 30 Humidification

Major Topic: Air Conditioning Systems

Topic 31 Air Conditioning Systems I

Topic 32 Air Conditioning Systems II

Topic 33 Air Conditioning Heat Recovery Systems

Topic 34 Air Conditioning System Controls

Topic 35 Heat Gains and Losses



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REFERENCE CURRICULUM

For

HVAC Plant Operator (2nd Class)



HVAC PLANT OPERATOR (2ND CLASS)

SYLLABUS

Introduction

This Curriculum is intended to assist candidates studying for the HVAC Plant Operator (2nd Class) Examination.

Recommended Study Program:

It is recommended that, before undertaking this examination, the candidate completes Power Engineering Course of study, offered through a recognized and approved technical institute or training provider which addresses the Syllabus - Curriculum Outline.



HVAC PLANT OPERATOR (2ND CLASS)

SYLLABUS

Reference Curriculum for HVAC Plant Operator (2nd Class) Examination Candidates

Major Topic: **Heating Systems and Human Comfort**

Topic 1 Heat Gains and Losses

Topic 3 Steam Heating Systems

Topic 4 Hot Water Heating Systems

Topic 5 Hot Water Heating System Equipment and Operation

Topic 6 Warm Air Heating System Equipment

Topic 7 Warm Air Furnace Components and Maintenance

Topic 8 Ventilation and Air Filters

Topic 9 Infrared and Electric Heating

Topic 10 Humidification

Topic 11 Electric Controls for Heating Systems

Major Topic: **Plumbing and Auxiliaries**

Topic 12 Building Water Supply Systems

Topic 13 Sanitary Drainage Systems

Major Topic: **Lighting**

Topic 14 Lighting Systems

Major Topic: **Refrigeration**

Topic 15 Refrigeration Theory

Topic 16 Refrigerants

Topic 17 Compression Refrigeration Systems

Topic 18 Refrigeration Compressors

Topic 19 Heat Exchangers for Refrigeration Systems

Topic 20 Refrigeration Accessories

Topic 21 Cooling Towers

Topic 22 Air Conditioning Systems

Major Topic: **Refrigeration**

Topic 23 Refrigeration Metering Devices and Capacity Controls

Topic 24 Refrigeration Cycle Controls

Topic 25 Compression Refrigeration System Pre-Startup Procedures



HVAC PLANT OPERATOR (2ND CLASS)

SYLLABUS

Major Topic: Pumps and Air Compressors

Topic 26 Air Compression

Topic 27 Pump Operation and Maintenance

Topic 28 Lubrication

Topic 29 Types of Bearing Lubrication

Major Topic: Distributed Generation

Topic 30 Microturbines

Topic 31 Internal Combustion (IC) Engine Gen-Sets

Topic 32 Compression Refrigeration System Pre-Startup Procedures

Topic 33 Compression Refrigeration System Operations