REFERENCE SYLLABUS

For

Power Engineer (3rd Class)
Introduction

This Syllabus is intended to assist candidates studying for the Power Engineer (3rd 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.
Reference Syllabus for Power Engineer (3rd Class) Examination Candidates

**Major Topic: Applied Mechanics, Thermodynamics, and Chemistry**

- **Topic 1** Forces and Friction
- **Topic 2** Work, Power, Energy: Linear and Angular Motion
- **Topic 3** Heat, State Change, Calorimetry
- **Topic 4** Thermal Expansion and Heat Transfer
- **Topic 5** Steam Properties and Calculations
- **Topic 6** Gas Laws and Calculations
- **Topic 7** Chemistry Fundamentals
- **Topic 8** Metallurgy and Materials
- **Topic 9** Corrosion Principles

**Major Topic: Boiler Codes, Electrical and Instrumentation Theory**

- **Topic 1** Legislation and Codes for Power Engineers
- **Topic 2** Code Calculations - ASME Section I
- **Topic 3** Fuels, Combustion, and Flue Gas Analysis
- **Topic 4** Piping Design, Connections, Support
- **Topic 5** Steam Traps, Water Hammer, Insulation
- **Topic 6** Valves and Actuators
- **Topic 7** AC Theory and Machines
- **Topic 8** AC Systems, Switchgear, Safety
- **Topic 9** Electrical Calculations
- **Topic 10** Control Loops and Strategies
Major Topic: Pumps and Boilers

Topic 1 Watertube Boiler Designs
Topic 2 Special Boiler Designs
Topic 3 Boiler Construction
Topic 4 Boiler Heat Transfer Components
Topic 5 High Pressure Boiler Fittings
Topic 6 Burner Designs and Supply Systems
Topic 7 Boiler Draft and Flue Gas Equipment
Topic 8 Boiler Control Systems
Topic 9 Boiler Procedures
Topic 10 Internal Water Treatment for Boilers
Topic 11 Boiler Water Pretreatment
Topic 12 Pressure Vessels

Major Topic: Prime Movers and Refrigeration

Topic 1 Steam Turbine Auxiliaries and Operation
Topic 2 Turbine Condenser Systems
Topic 3 Gas Turbine Principles and Designs
Topic 4 Gas Turbine Auxiliaries and Operation
Topic 5 Cogeneration Systems and Operation
Topic 6 Compressor Theory and Designs
Topic 7 Compressor Auxiliaries and Operation
Topic 8 Refrigeration Principles and Systems
Topic 9 Refrigeration Auxiliaries and Operation
Topic 10 Heat Exchangers and Cooling Towers
Topic 11 Fired Heaters
Topic 12 Wastewater Treatment
Topic 13 Plant Maintenance and Administration