REFERENCE SYLLABUS

For

International Power Engineer (2nd Class)
Introduction

This Syllabus is intended to assist candidates studying for the International Power Engineer (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 Outline.
Reference Syllabus for International Power Engineer (2nd Class) Examination Candidates

Major Topic: Code Calculations and Legislation
Topic 1 A.S.M.E. Code Calculations - Cylindrical Components
Topic 2 ASME Code Calculations: Stayed Surfaces, Pressure Relief Valves and Furnaces
Topic 3 Boiler and Pressure Vessel Legislation
Topic 4 Plant Design and Installation
Topic 5 Management and Supervision
Topic 6 Plant Maintenance
Topic 7 Safety
Topic 8 Linear Motion
Topic 9 Angular Motion
Topic 10 Friction
Topic 11 Static and Dynamic Forces
Topic 12 Fluid Mechanics

Major Topic: Thermodynamics and Metallurgy
Topic 1 Heat, Expansion of Solids, and Heat Transfer
Topic 2 Thermodynamics of Gases
Topic 3 Thermodynamics of Steam
Topic 4 Practical Thermodynamic Cycles
Topic 5 Metallurgy
Topic 6 Testing of Metals
Topic 7 Corrosion of Metals
Topic 8 Introduction to Welding Symbols
Major Topic: **Boilers and Water Treatment**

*Topic 1* Boiler and Steam Generator Components and Design  
*Topic 2* Specialized Boiler Designs  
*Topic 3* Boiler and Steam Generator Operation  
*Topic 4* Boiler and Steam Generator Maintenance and Inspection  
*Topic 5* Pumps  
*Topic 6* Water Chemistry and Analysis  
*Topic 7* Water Pre-Treatment I  
*Topic 8* Water Pre-Treatment II  
*Topic 9* Internal Water Treatment  
*Topic 10* Non-Boiler Water Treatment  

Major Topic: **Prime Movers**

*Topic 1* Steam Turbine Theory and Construction  
*Topic 2* Steam Turbine Auxiliaries and Control  
*Topic 3* Steam Turbine Operation and Maintenance  
*Topic 4* Steam Condensers  
*Topic 5* Internal Combustion Engines: Components and Auxiliaries  
*Topic 6* Internal Combustion Engines: Operation and Maintenance  
*Topic 7* Gas Turbine Design and Auxiliaries  
*Topic 8* Gas Turbine Operation and Control  
*Topic 9* Lubrication  
*Topic 10* Piping  
*Topic 11* Mechanical Drawing
Major Topic: **Combustion and Plant Systems (344 pages)**

- Topic 1 Power Plant Fuel Systems
- Topic 2 Power Plant Water and Steam Systems
- Topic 3 Measurement and Control Components
- Topic 4 Control Instrumentation Systems
- Topic 5 Fuels and Combustion Calculations
- Topic 6 Firing and Draft Equipment
- Topic 7 Combustion Control and Safeguards
- Topic 8 Environmental Monitoring
- Topic 9 Environmental Control Methods

Major Topic: **Electricity and Refrigeration**

- Topic 1 Alternating Current Theory
- Topic 2 Direct Current Machines
- Topic 3 Alternating Current Generators
- Topic 4 Alternating Current Motors
- Topic 5 Transformers
- Topic 6 Electrical System Protection
- Topic 7 Air and Gas Compression
- Topic 8 Refrigeration Systems and Equipment
- Topic 9 Refrigeration Safety, Control, and Operation
- Topic 10 Refrigeration Calculations