REFERENCE SYLLABUS

For

International Power Engineer (1st Class)
Introduction

This Syllabus is intended to assist candidates studying for the International Power Engineer (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.
Reference Syllabus for International Power Engineer (1st Class) Examination Candidates

**Major Topic: Applied Thermodynamics and Plant Cycles**
- Topic 1 Rankine and Brayton Cycles
- Topic 2 Thermodynamics of Steam
- Topic 3 Steady Flow Process Calculations
- Topic 4 Thermodynamics of Perfect Gases
- Topic 5 Expansion and Heat Transfer
- Topic 6 Refrigeration Calculations

**Major Topic: Principles of Applied and Fluid Mechanics**
- Topic 1 Lifting Machines
- Topic 2 Energy and Momentum
- Topic 3 Centripetal Force and Acceleration
- Topic 4 Torque and Torsion
- Topic 5 Stress and Strain
- Topic 6 Static Fluids
- Topic 7 Fluids in Motion

**Major Topic: Applied Engineering Technologies**
- Topic 1 Metallurgy
- Topic 2 Corrosion, Chemistry and Processes
- Topic 3 Boiler Corrosion
- Topic 4 Corrosion Monitoring and Prevention Techniques
- Topic 5 Corrosion Prevention Programs
- Topic 6 Fuel Types
- Topic 7 Burner Design
- Topic 8 Combustion Optimization
- Topic 9 Combustion Safety and Emissions
- Topic 10 Water Pre-Treatment
- Topic 11 Internal Water Treatment
- Topic 12 Water Treatment Management
- Topic 13 Non-Boiler Water Treatment
Major Topic: **Power Plant Operations**

Topic 1 Electrical Energy Management  
Topic 2 Plant and Equipment Efficiencies  
Topic 3 Power Plant Construction  
Topic 4 Commissioning and De-Commissioning  
Topic 5 Retrofitting

Major Topic: **Legislation and Codes for Industrial Equipment**

Topic 1 Codes, Acts and Regulations  
Topic 2 ASME Section I  
Topic 3 ASME Section VIII and IX  
Topic 4 CSA B-51 and B-52  
Topic 5 Piping and API Codes

Major Topic: **Safety, Loss, and Environmental Program Management**

Topic 1 Loss Control  
Topic 2 Safety Legislation  
Topic 3 Safe Work Programs  
Topic 4 Emergency Response and Incident Investigation  
Topic 5 Environmental Legislation  
Topic 6 Environmental Management
Major Topic: Inspection, Maintenance and Repair Practices

Topic 1 Project Management
Topic 2 Maintenance Management Practices
Topic 3 Boiler Repairs
Topic 4 Pressure Vessel and Piping Repairs
Topic 5 Non-Destructive Examination
Topic 6 Rotating Equipment Maintenance
Topic 7 Rotating Equipment Monitoring

Major Topic: Business and Workforce Management

Topic 1 Business Management
Topic 2 Contract Management
Topic 3 Problem Solving and Decision Making
Topic 4 Leadership
Topic 5 Communication and Conflict Resolution
Topic 6 Labor Relations
Topic 7 Recruitment and Employee Development
Topic 8 Management Structures and Organization