

Combined Cycle CT Plant Operating Engineer First Class

Minimum age - Adult

Education - High School Diploma / GED or Equivalent

Experience - Four years

Examination - Written (Oral or Practical when necessary)

Minimum time in previous grade - One year or one year in grade as a Simple Cycle
Operating Engineer 1st class.

Maximum Prime Mover Horsepower (Unsupervised) - 7500

Maximum Boiler Size (Unsupervised) HP - 1500 BHP / LP Unlimited BHP

Maximum Refrigeration or Air Conditioning (Unsupervised) - 5000 tons

Curriculum at the Minimum:

- Suitability for Peaking and Black Start
- The Aero Jet Engine
- Gas Generator
- Multi-shaft Arrangements
- Shaft Speeds
- Auxiliary Systems
- Compressed Air Starting
- Start-up and Operating Procedures
- Controls
- Operator-Maintenance Coordination
- Types of Maintenance: Running, Predictive and Preventive
- Operator Observations, Abnormalities and Defect Reports
- On-line and Off-line Maintenance
- Pressures and Temperatures
- Performance Testing
- Vibration Analysis
- Pre-planned Maintenance and Scheduled Outages
- Inspections: Combustion Equipment, Hot Gas Path and Major Overhaul
- Examination by Borescope
- Heat Contained in Exhaust Gas
- Heat Recovery
- Control of Exhaust Gas Temperature
- GT Load
- Inlet Guide Vanes
- Auxiliary Burners
- Typical Combined Cycle Configurations
- Steam Turbines for Combined Cycle
- HRSG Steam Bypass to Condenser
- Start-Up and Control of Combined Cycle Unit
- Generator Construction
- Hydrogen and Air Cooling
- Excitation Systems
- Control of MVARs

- Synchronizing
- Parallel Operation
- Auxiliary Power Supplies
- Generator Protection
- Basic Management Skills
- Electrical Transmission and Distribution Systems
- General Industrial Safety
- Environmental Regulations and Protection.