

Fuels and Combustion

This three-days course is designed to provide participants with a working knowledge of the combustion process used in modern power plant applications. Different fuels, the equipment used to burn these fuels, and the monitoring of the emissions is covered in detail. Emission

I. Fuels

- Fuel Characteristics
- Solid Fuels
- Gaseous Fuels
- Safety
- Liquid Fuels

II. Combustion

- Coal Oil and Gas
- Combustion Process

III. Basic and Ideal Combustion

- Basic Combustion
- Ideal Combustion
- Combustion Control

IV. Components of a Burner Port

- Diffuser
- Air Register
- Burner Throat
- Ignitor
- Flame Detectors

V. Factors Affecting Proper Combustion

- Flame Characteristics
- Oil Flame
- Gas Flame
- Smoke

VI. Performance Monitoring

- Checking Combustion Efficiency
- Performance Monitoring
- Corrosion, Deposits, and Emissions Control
- Boiler Efficiency Related Factors
- Combustion Related Factors
- Stack Gas Waste Heat Losses
- Combustible Losses
- Radiation Losses
- Waterside Losses
- Steam Heat Loss Factors
- Boiler Maintenance Practices
- Blower Factors
- Air Heaters
- Boiler Auxiliaries

VII. Furnace Safeguards Supervisory System (FSSS)

- Overview
- FSSS Role in Steam Generating Process
- Unintentional Fires External to Furnace

VIII. Plant Emissions and Clean Air Act

- Emissions
- Particulate
- Sulfur Oxide

- Nitrogen Oxide
- Fly Ash
- Optical Properties of Flyash

IX. Overview of Continuous Emission Monitoring (CEM)

- SO₂ Monitoring
- NO_X Monitoring
- Volumetric Flow
- Opacity
- Diluent Gas (O₂ or CO₂)
- Records