

# AMICE12 POWER PLANT INSTRUMENTATION

## UNIT-1 AN OVERVIEW

- 1.1 Brief survey of methods power generation-hydrothermal, nuclear, solar, wind etc.
- 1.2 Dependence of instrumentation on the method of power generation, power plant general structure.
- 1.3 Pulvarizers& burners nans, dampers and actuators, super heaters, steam traps, feed water, generation turbines cooling system. Importance of instrumentation and control.
- 1.4 Reading and drawing of instrumentation diagram: flow sheet symbols –ANSI symbols for lines, valve, heat transfer, dryer, material handling equipment, storage vessels, flow sheet codes &lines.
- 1.5 Graphical symbol for pipe fitting, valves and piping, instrumentation symbols, standards specifications for flow, temperature.
- 1.6 One line diagram of typical pneumaisic, hydraulic and electrical instrumentation system.

## UNIT-2 PARAMETERS AND MEASUREMENTS:

- 2.4 Electrical measurements -current, voltage , power, frequency-nonelectrical parameters,
- 2.5 Flow of feed water , fuel , air & steam with correction factors for temperature pressure level, radiation detectors-smoke density measurement ,

## UNIT-3 CONTROL LOOPS & INTERLOCKS

- 3.1 Combustion control- control of pressure, air /fuel ratio, furnace draught and excess air control, drum level (three element) control .main and reheat steam temperature control.
- 3.2 Burner tilting up , by pass damper- super heater spray & gas recirculation control -BFP recirculation control -hot well &aerator level control
- 3.3 Interlock MFT turbine trip conditions- Pulverizer control.

## UNIT-4 TURBINE MONITORING& CONTROL

- 4.1 Condenser vacuum control - gland steam exhaust pressure control -speed, vibration, shell temperature monitoring- lubricating oil temperature control.
- 4.2 H2 generator cooling system Nuclear reactor control loops- description- function- safety measures in nuclear reactor control

## UNIT-5 ANALYSERS IN POWER PLANT

- 5.1 Thermal conductive type- paramagnetic type- oxygen analyzer- infrared type and trim analyzer- spectrum analyzer- hydrogen purity meter chromatography- ph meter
- 5.2 Conductivity cell- fuel analyzer, pollution monitoring and control Computer in power plant: load dispatching computer, generation station computer, supervisory, DLC,DAS and DCC.

## References Books:

1. Modern power station practice, Volume 6, Instrumentation,Control and Testing – Pergamon Press, Oxford.
2. E.L. Wakil MM – Power Plant Technology – McGraw Hill