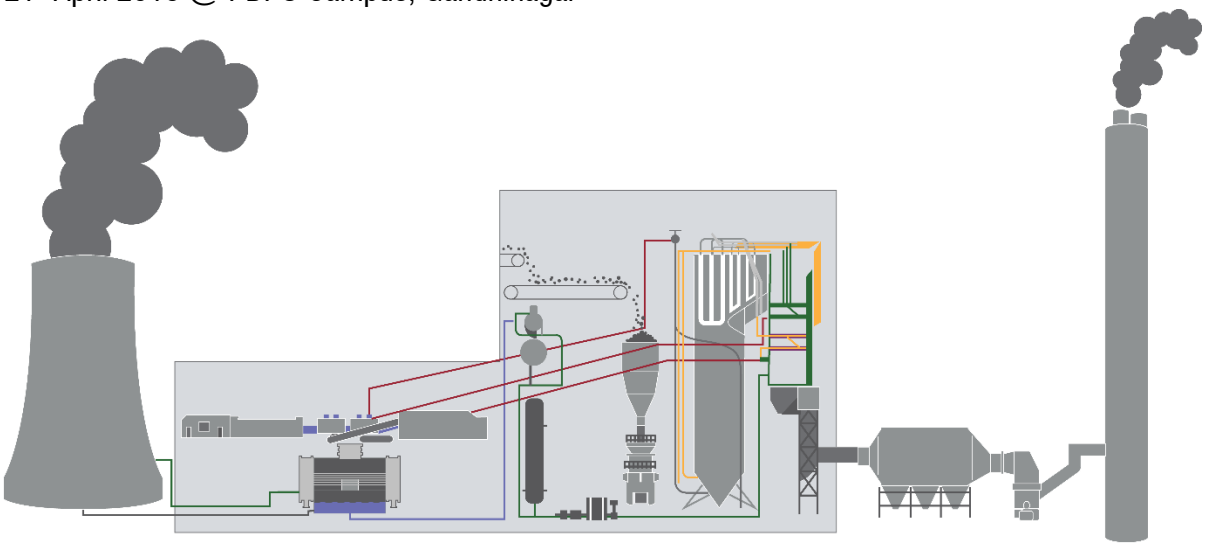
Three days hands on workshop on

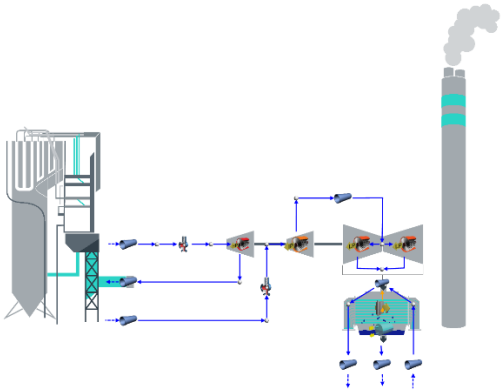
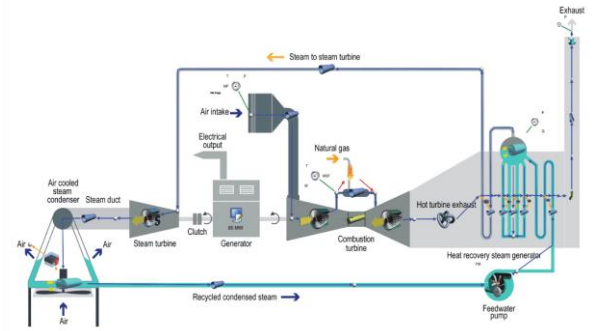
Thermal –Hydraulic Modelling & Simulation of Thermal Power Plants

Systems, Subsystems, Component Level Modelling

19th -21st April 2018 @ PDPU Campus, Gandhinagar



Topics Covered	Typical problems modelled/demonstrated *[one or two cases on each category will be modelled in the workshop, remaining will be demonstrated based on the time availability]*	
Section 01: Introduction &Fundamental Theory	• Fluid Mechanics • Heat Transfer • Thermodynamics	
Section 02: Steady State Analysis	• Steady State Evaluation of Fluid Mechanics, Heat Transfer and Thermodynamics simulations	
Section 03: Transient Analysis	• Transient Simulation of real time applications atcomponent, subsystem and system level evaluations	
Section 04: Advanced Thermal Fluid	• Simulation of Gaseous mixtures, Homogeneous two-phase flow, coupled heat transfer through solidstructures, combustion modeling and beyond	
Section 05: Feedwater Systems	**Practical Session**	**Demonstration**
	• Feedwater heater	• Pump performance and NPSH. • performance and tube leaks. • Flash tank behavior. Pipeline, valve and pump sizing. • Cavitation, flashing and condensing detection.
Section 06: Steam Turbine & Supporting Systems	**Practical Session**	**Demonstration**
	• Assess cooling system and heat exchanger performance	• Lubrication systems. • Generator hydrogen and lubrication systems. • Start-up, shutdown and load following operation. • Turbine trip control. • Gland steam systems.
Section 07: Cooling Water Circuits	**Practical Session**	**Demonstration**
	• Water Hammer	• Heat exchanger sizing. • Water reticulation flow balancing & energy efficiency. • Pipeline, valve and pump sizing. • Water hammer. • Cooling tower response.

Section 08: Ash Slurry	**Practical Session**	**Demonstration**
	• Slurry Modeling	• Slurry settling and blockage. • Pump and pipe sizing. • Plant expansion.
		
Section 09: Boiler Steam Systems	**Practical Session**	**Demonstration**
	• Load changes. Once-through and reheat boilers. • Natural circulation boiler. • Recirculation rate and steam production.	• Attemperator system. • Dry out prediction. • Temperature calculation and change rates. • Boiling stability & boiling regime examination. • Detection of boiling oscillations (Ledinegg, density wave, pressure drop-type)
Section 09: Boiler Auxiliary Systems	**Practical Session**	**Demonstration**
	• Flow balancing in branching networks. • Pipe heat loss estimation.	• Control philosophy testing. • Pump/pipe/injector matching. • Draught group/Flue gas system • Pump sizing and viscosity adjustment. • Start-up fuel oil or gas systems.
Section 10: Natural Circulation Boiler	**Practical Session**	**Demonstration**
	• Boiler Modeling	• Prediction of dry out. • Calculation of recirculation rate and steam production.
Section 11: Condensers	**Practical Session**	**Demonstration**
	• Condenser level following.	• Wet and dry condenser heat exchange • Air leak detection.
Section 12: Valves	**Practical Session**	**Demonstration**
	• Transient Analysis of Valve	• Valve Design, Optimisation • Valve Sizing • Two – Phase Valve Dynamic Response of Valves • Water Hammer
Section 13: Compressors & Heat Exchanger	**Practical Session**	**Demonstration**
	• Heat Exchanger Modeling • Compressor Modeling	• Modeling of Positive Displacement, Axial, Centrifugal Compressors • Lumped Heat Exchanger Model – Comparison of various Heat Exchanger Performance, Heat Transfer Studies
Section 14: Pumps & Turbos	**Practical Session**	**Demonstration**
	• Pump Modeling • Turbine Modeling	• Modeling of Different Pumps • Modeling of Turbines

Section 15: Combined Cycle Plant	Demonstration
	• High level analysis and design of the complete combined thermodynamic cycle. • Transient analysis of load change scenarios. • Cycle efficiency analysis under different ambient conditions. • Root cause analysis for fault finding.

About the Workshop

Workshop aims to cover from fundamental theory to real-time application modeling involving fluid mechanics, heat transfer and thermodynamics concept. We will be using Flownex – Thermal Fluid Simulation Software – More details on www.flownex.com

The expert panel will address the queries of participants and participants are encouraged to bring their model, problem, or queries and get an answer from expert panel.

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Registration Details

Registration Fee: INR 3,500.00 + GST 18%

Registration Fee can be paid in the form of
DD/Cheque/Cash in favour of "DHIO – Center for Excellence" payable at Bangalore

Who Should Attend?

Director/CEO/Managers/Engineers involved in Fluid Mechanics, Heat Transfer, Thermodynamics Calculations, Research, Engineering Design, Analysis, Testing, Modeling and Commissioning of Thermal Fluid Systems from Energy/Power Generation, Process, Oil & Gas, HVAC, Automotive, Aerospace, Mining and allied industries can participate.

It is not mandatory to have any computational modeling experience; however, physics of system, subsystem and component understanding will help