PIPENET - Hydraulic Fluid Flow Analysis (IGT-FFT)

Course Length:	24 Hours.

This course is designed for the graduate mechanical engineers who want to become a piping engineer and who would like to pursue their career in Plant design industry specifically as Piping designers, HSE / Fire and safety engineers. The course covers an overall knowledge about the role of Process, Piping / HSE engineers and how they engineers integrate into an engineering organization. The course also discusses about various industry codes which the engineer should be familiar with.

Prerequisites:

- Engineering experience is required.
- Basic Plant design/ engineering knowledge is required.
- Working knowledge of AutoCAD 2007.
- It is also recommended that you have a working knowledge of Microsoft® Windows® XP,
- Microsoft® Windows® 2000, or Windows NT® 4.0.

Curriculum

Day 1:

Part 1- Presentation

- Introduction to PIPENET
- Description of the modules of PIPENET
- Principles of schematic input
- Description of various components and input
- PIPENET Transient module
- Description of various terms in Transient module – Liquid properties, Pipe Properties, wave speed, Joukoski equation, unbalanced forces

Part 2- Training Example 1

- Modeling Cooling Water System with Standard Module
- Description of example
- Rules regarding specifications
- Modeling of heat exchangers – as fixed pressure drops/as devices
- Pipe sizing techniques available in PIPENET
- Input and solution of base case
- Examining Tabular output
- Cut and paste tabular results into reports

Part 3- Modeling Firewater Systems with Spray/Sprinkler Module

- Techniques for designing fire protection systems
- What to look for in the design of deluge systems
- What to look for in the design of firewater ringmains
- Description of a deluge system example
- Spray nozzles/sprinkler

DAY 2

Part 4- Training Example 2-Tanker Loading System with Transient Module

- Description of example
- Input and solution of base case, without check valve
- Base case with different valve closure times

- Tabular output
- Graphical output
- Case with check valve
- Case with check valve with different valve closure times
- Quadratic valve closure
- Step-wise valve closure

Part 5 - Training Example 5-Modelling Pipelines

- Description of example
- Input and solution of base case
- Base case with different valve closure times
- Base case with different valve closure patterns
- Pipes in parallel with valve closure/use of short pipes
- Simultaneous valve closure
- Modeling pipe rupture
- Use of accumulators
- Importance of tabular output
- Graphical output
- Superimposing graphs and Changing graph properties – line thickness, titles
- Legends and arrows in graphs
- Cut and paste tabular and graphical results into reports

Part 6 -Training Example 6 - Calculation of Hydraulic Transient Forces

- Why this is important
- Relationship with CAESAR II
- Types of force – total and dynamic
- Unbalanced forces
- Principle of control volumes – direction, sense and position
- Description of example
- Several cases of force calculation & Forces output file

DAY 3

Part 7 - Case study -Transient Analysis for a Fire water system for an offshore platform using PIPENET

- Surge scenarios in a fire water system
- Model build up caisson, fire water pump, deluge valves, air release valves, jockey pump, check valves, pressure relief valves
- Detailed analysis of each surge scenario
- Tabular output
- Graphical output

Part 8 - PIPENET vs. CAESAR II and Piping Design

- Usage of PIPENET forces in CAESAR II
- CAESAR II static analysis with PIPENET forces CAESAR II static analysis with PIPENET forces
- CAESAR II dynamic analysis with import of PIPENET forces
- Piping design for pressure surges
- Pipe supports design for pressure surges