COURSE OVERVIEW ME0630-4D

The Layout of Piping Systems & Process Equipment

Course Title
The Layout of Piping Systems & Process Equipment

Course Date/Venue
October 14-17, 2024/ Al Azziya Hall, The Proud Hotel Al Khobar, KSA

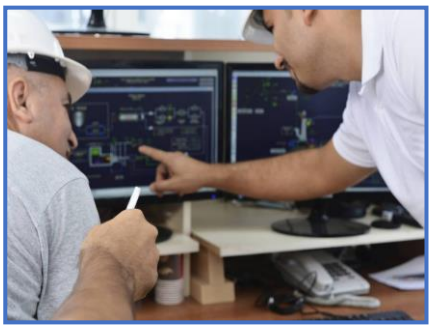
Course Reference
ME0630-4D

2.4 CEUs (24 PDHs) AWARD

H-STK© INCLUDED

Course Duration/Credits
Four days/2.4 CEUs/24 PDHs

Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course will familiarize engineers, designers and construction personnel with layout, design procedures and practices involved in the location of equipment and layout of piping systems. Traditionally there has been little formal training in this area and design decisions have to be made based on practical considerations without formulae or code reinforcement.

Completing piping arrangements take up the majority of manhours in the design of a process plant and the designer is required to apply acceptable layout procedures. This is an intensive five day course that will give attendees the background required to complete a typical equipment layout and piping arrangement.

The course will also highlight the equipment layout and plot plans; civil, structural, electrical, instrumentation and maintenance considerations; distribution systems; pipe racks; pumps and piping, layout at horizontal centrifugal, vertical inline, double suction, positive displacement, performance characteristics, maintenance, cavitation, suction piping considerations, strainers, valving, parallel layouts, series layouts, supports, loads at nozzles.

During this interactive course, participants will learn the heat exchanger piping, maintenance requirements, shell and tube, plate, fin fan, valving, T.E.M.A. standards; horizontal and vertical vessels, placement, nozzle orientation, internals, platforms, ladders, manholes, maintenance requirements, valving, instrumentation, process considerations; and the process and utility piping.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply systematic techniques in the layout of piping systems and process equipment including design procedures and good international practices
- Implement the correct procedures involved in the layout of process equipment and piping system for a typical process unit containing pumps, valves, hangers, tanks, exchangers, horizontal drums and vertical towers
- Employ the requirements for the design and layout of piping system in order to achieve a well structured installation of piping systems and process equipment
- Identify the factors that should be considered in the layout of equipment and plotting of plans including civil, structural, electrical and instrumentation aspects and other maintenance considerations
- Practice the various types of design and layout of piping system through workshops including process & utility piping, pump piping, storage tank piping, steam and condensate piping
- Implement nozzle orientation procedures in horizontal and vertical vessels
- Apply proper CAD techniques used in piping layout and piping stress analysis
- Perform the proper methodology for stress analysis using stress analysis programs and build flexible layouts

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor's actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects of the layout of piping systems & process equipment for piping, process and design engineers and designers entering the plant design field, senior draftsmen, piping and process draftsmen and practicing engineers requiring to expand their understanding of layout procedures. Further, it is suitable for piping fabricators, contractors and suppliers wishing to understand the relationship of manufacture and fabrication to the design, layout and construction of piping systems and piping design as well as analysis personnel wishing to expand their knowledge through this program which will offer practical solutions to design problems.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations: -

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **2.4 CEUs** (Continuing Education Units) or **24 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. George Poulos, MBA, MSc, BSc, CEng, is a **Senior Mechanical & Maintenance Engineer** with over **45 years** of extensive experience within the **Oil & Gas, Petrochemical, Refinery, Construction, Aircraft & Shipbuilding** Industry. His wide experience cover in the areas of **Reliability** Engineering, **Maintenance & Reliability** Best Practices, Reliability, Availability & Maintainability (**RAM**), **Root Cause** Analysis, **Maintenance** Process, **Reliability-Centered Maintenance** (**RCM**), **Reliability Engineering Analysis** (**RE**), **Root Cause Analysis** (**RCA**), **Asset Integrity Management** (**AIM**), **Reactive & Proactive** Maintenance. **Maintenance Management**, **Aluminium** Oxides, **Aluminium Smelting** Process, Basic **Steel Making** Process, **Hot Rolling** Process, **Hot Strip Mill**, **Mill** Operations, **Roll Mill**, **Steel Making** Process, **Steel** Manufacturing, **Electric Arc Furnace** (**EAF**), **Steel Forging**, **Steel** Manufacturing & Process Troubleshooting, **Slit Rolling**, **Carbon Steel Pipe** Wall Thickness & Grade Selection, **Ferro-Alloys**, **Steel Metallurgy**, **Steel** Structure Welding, **Steelmaking** Slag, **Steel** Making Application, **Heat Treatment** & **Prevention Techniques**, **Corrosion** Fabrication & Inspection and **Post Weld Heat Treatment**. Further, he is also well-versed in **Welding** Inspection, **Welding** & **Machine** Techniques, **TIG** & **Arc Welding**, **Shielded Metal Arc Welding**, **Gas Tungsten** & **Gas Metal Arc Welding**, **Welding** Procedure Specifications & Qualifications, **Aluminium Welding**, **Hot Work-Safety**, **SMAW**, **GTAW**, **Welding** Techniques, **Pipeline Welding** Practices, **Welding** Engineering, **Welding** Fatigue & Fracture Mechanics, **Welding Inspection Technology**, **Welding Safety**, **Welding** Defects Analysis, **Welding Technology**, **Welding Problems**, **Welding & Non Destructive** Testing and **Metallurgy Techniques**.

During his career life, Mr. Poulos has gained his practical and field experience through his various significant positions and dedication as the **Chief Executive**, **Head of Technical Studies**, **Manager**, **Senior Consultant**, **Lead Welding Engineer**, **Senior Welding Engineer**, **Design Engineer**, **Sales Engineer**, **Author**, **Welding Instructor**, **Visiting Lecturer** and **Technical Proposal Research Evaluator** from various international companies such as Greek Welding Institute, Hellenic Quality Forum and International Construction Companies such as Shipbuilding, Aircraft Industry and Oil and Gas Industry.

Mr. Poulos is a **Registered Chartered Engineer** and has a **Master's** degree in **Naval Architecture**, a **Bachelor's** degree in **Welding Engineering** and a Master of Business Administration (**MBA**) from the **Sunderland University**, **Aston University** and **Open University**, **UK**, respectively. Further, he is a **Certified Trainer/Instructor**, an active Member of Chartered Quality Institute (**CQI**), The British Welding Institute (**TWI**), The Royal Institution of Naval Architects (**RINA**) and American Welding Society (**AWS**), a Registered **EWF/IW** (European Welding Federation-International Welding Institute W/E) and an **IRCA** Accredited External Quality Systems Auditor through BVQI. He is an **Author** of Technical Book dealing with Protection/Health/Safety in the Welding/Cutting domain and delivered various trainings, seminars, conferences, workshops and courses globally.

Course Fee

US$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: ***Sunday, 14th of October 2024***

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Introduction to Piping Layout*** *P&ID's ● Piping Arrangements ● Isometrics ● B.O.M.'s ● Piping Specifications*
0930 – 0945	*Break*
0945 – 1030	***Piping Components & Valves*** *Fittings – Butt Weld ● Socket Weld ● Threaded, Valve Types & Application*
1030 – 1100	***Equipment Layout & Plot Plans*** *Civil, Structural, Electrical, Instrumentation, Maintenance Considerations*
1100 – 1215	***Process & Utility Piping*** *Design & Layout of Piping Containing Liquid ● Vapour ● Steam ● Condensate ● Slurries ● Etc.*
1215 – 1230	*Break*
1230 – 1300	***Workshop (1)*** *Problem Set*
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2: ***Monday, 15th of October 2024***

0730 – 0830	***Workshop (1) Review***
0830 – 0930	***Distribution Systems*** *Plot Plans ● Pipe Racks – Line Spacing ● Pipe Spans ● Alloy Lines ● Vibrating Lines ● Expansion Loops*

0930 – 0945	*Break*
0945 – 1030	***Pipe Supports & Hangers*** *Selection & Location ● Anchors ● Guides ● Restraints ● Variable Springs ● Constant Load Springs*
1030 – 1130	***Horizontal Vessels*** *Placement ● Nozzle Orientation ● Internals ● Platforms ● Ladders*
1130 – 1215	***Pumps & Piping*** *Layout at Horizontal Centrifugal ● Vertical Inline ● Double Suction ● Positive Displacement ● Performance Characteristics ● Maintenance ● Cavitation ● Suction Piping Considerations ● Strainers ● Valving ● Parallel Layouts ● Series Layouts ● Supports ● API 610 Loads at Nozzles*
1215 – 1230	*Break*
1230 – 1420	***Heat Exchangers*** *Shell & Tube ● Fin-Tube ● Plate ● Piping Layout Considerations ● Nozzle Loading*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3: Tuesday, 16th of October 2024

0930 – 1015	***Workshop (2)*** *Review*
0930 – 0945	*Break*
0945 – 1030	***Fin Fans*** *Locations ● Types ● Piping Arrangements*
1030 – 1130	***Storage Tanks*** *Tank Types ● Fixed & Floating Roofs ● Dyked Area Design ● Fire Protection ● Off Site Piping*
1130 – 1230	***Instrumentation*** *Level, Flow, Pressure & Temperature Variables ● Control Valves & Sets ● Relief Valves*
1230 – 1245	*Break*
1245 – 1330	***Steam & Condensate Piping*** *Steam Traps ● Condensate Collection Systems ● Drip Legs ● Steam Tracing Manifolds*
1330 – 1420	***Towers & Vertical Vessels*** *Distillation Columns ● Tower Internals ● Trays ● Packings ● Reboilers ● Nozzle Orientation ● Piping at Towers ● Supports ● Platforms & Ladders ● Piping Layout*
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

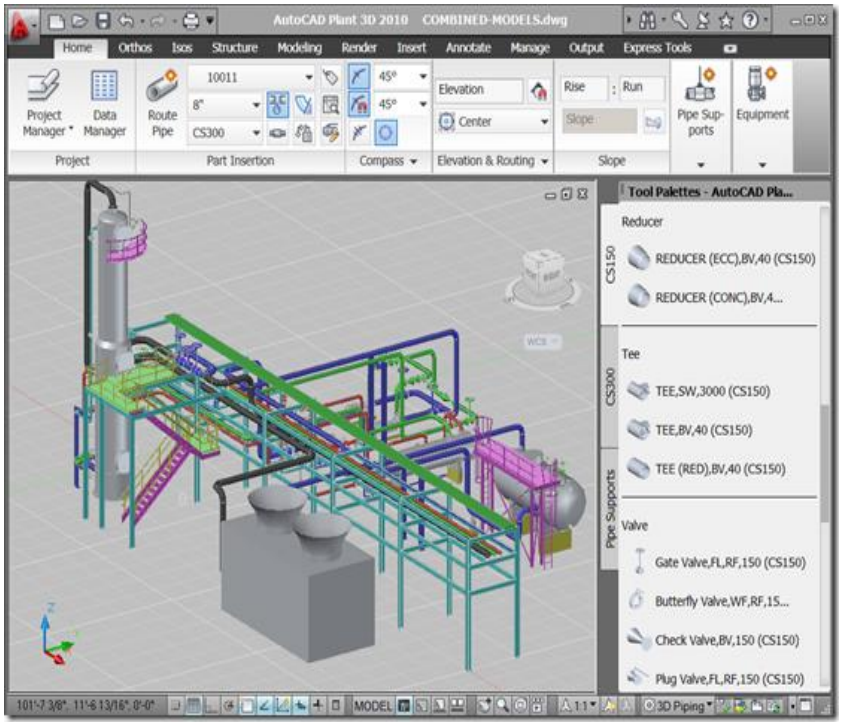
Day 4: Wednesday, 17th of October 2024

0730 – 0830	***Workshop (3)*** *Review*
0830 – 0930	***Compressors*** *Reciprocating ● Centrifugal ● Piping at Compressors ● Vibration Considerations*
0930 – 0945	*Break*

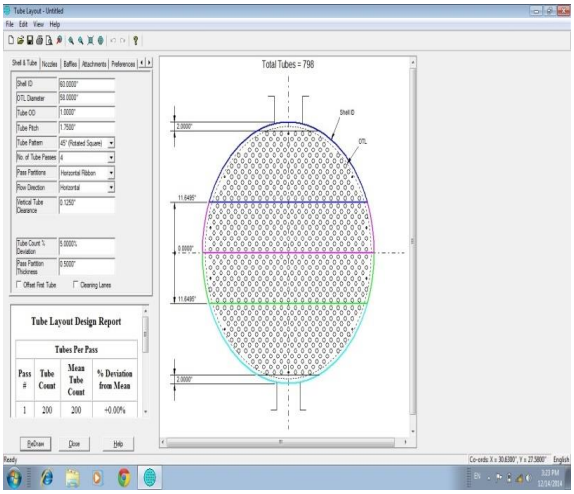
0945 – 1030	***Workshop (4)*** *Problem Set*
1030 – 1130	***Purposes of Stress Analysis*** *Methodology ● Static Analysis ● Using Stress Analysis Programs*
1130 – 1215	***Stress Analysis*** *Building Flexible Layouts*
1215 – 1230	*Break*
1230 – 1330	***Static Stress Analysis*** *Problem Set*
1330 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (Hands-on Practical Sessions)

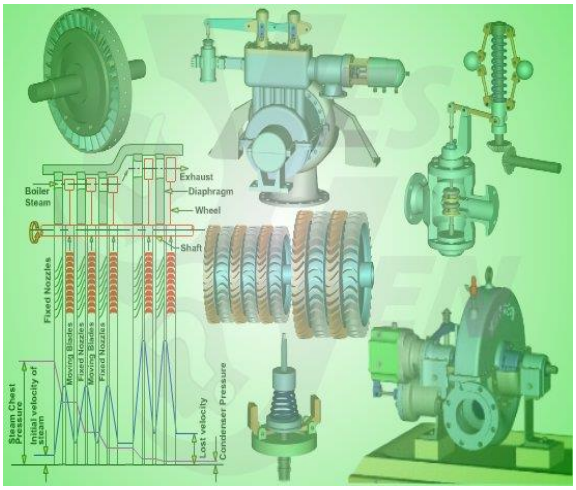
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art simulators "Autocad Piping Software", "Heat Exchanger Tube Layout Simulator", "Steam Turbines & Governing System CBT", "Single Shaft Gas Turbine Simulator" and "Two Shaft Gas Turbine Simulator".



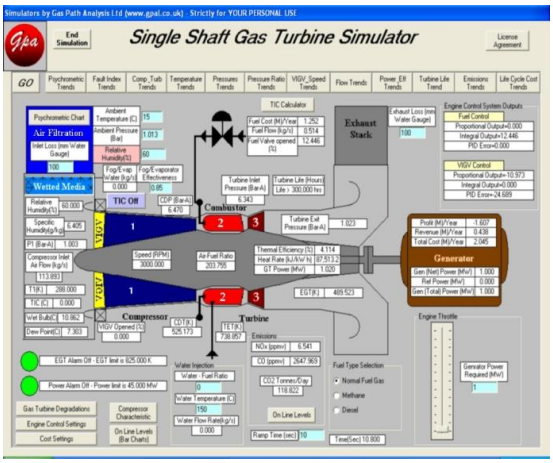
Autocad Piping Software



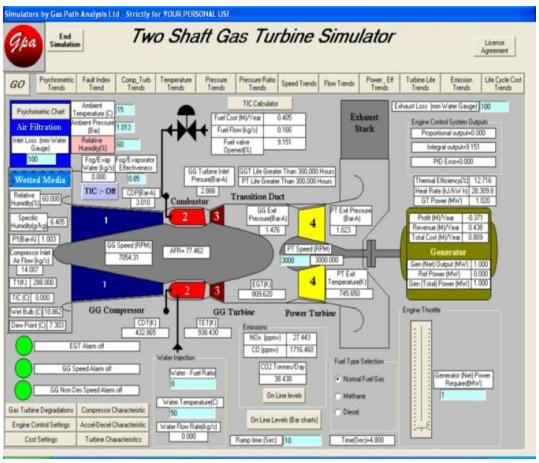
Heat Exchanger Tube Layout Simulator



Steam Turbines & Governing System CBT



Single Shaft Gas Turbine Simulator



Two Shaft Gas Turbine Simulator

Course Coordinator

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