COURSE OVERVIEW ME0805-4D
CAESAR-II Advance Training on Piping Dynamic, Static & Other Special Analysis

Course Title
CAESAR-II Advance Training on Piping Dynamic, Static & Other Special Analysis

Course Reference
ME0805-4D

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

Course Date/Venue

Session(s)	Date	Venue
1	January 08-11, 2024	Jubail Hall, Signature Al Khobar Hotel, Al Khobar, KSA
2	May 06-09, 2024	Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
3	October 14-17, 2024	Ajman Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	December 09-12, 2024	Business Center, Concorde Hotel Doha, Doha Qatar

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 is designed to provide participants with a detailed and up-to-date overview of CAESAR II static and dynamic. It covers the stress analysis and static loads design and sustained loads including pressure & weight loads for analysis; the temperature cases and cycles for analysis; the dynamic loads design and modal; the vibration analysis and the scope of thrust forces; the wind design and technical basis of the ASME B31 stress equations for pipelines and piping systems; and the stress intensification factors and allowable stress acceptable in piping.

During this interactive course, participants will learn the model input for static analysis and the steps in building the model; the decoupling and overlap rules; the types and stiffness of support models; the static analysis in piping and the output, displacement and stress limits in pipes and piping systems; the equipment nozzle loads, support loads and displacement; the thermal fatigue analysis and the various types of dynamic analysis; the dynamic model and modal check; the support-equipment flexibility and dynamic coupling; the vibration, transient and response spectra analysis; and the dynamic qualification and other types of analysis and become acquainted with buried pipe, double –wall pipe and equipment nozzles.

Course Objectives

Upon the successful completion of the course, participants will be able to:-

- Have a very good background of stress analysis and static loads design and become familiar with sustained loads including pressure & weight loads for analysis
- Understand the temperature cases and cycles for analysis and introduce the dynamic loads design
- Acquire knowledge on modal & vibration analysis and determine the scope of thrust forces
- Learn wind design and identify the technical basis of the ASME B31 stress equations for pipelines & piping systems
- Emphasize the stress intensification factors and allowable stress acceptable in piping
- Determine the model input for static analysis and know the steps in building the model
- Explain the decoupling and overlap rules and be able to illustrate the types and stiffness of support models
- Perform static analysis in piping and be able to recognize the output, displacement and stress limits in pipes and piping systems
- Know the equipment nozzle loads, support loads and displacement and be able to carry-out thermal fatigue analysis
- Review the various types of dynamic analysis and be able to analyze the dynamic model and modal check
- Employ support-equipment flexibility and dynamic coupling and be able to present some practical examples on vibration, transient & response spectra analysis
- Learn the dynamic qualification and other types of analysis and become acquainted with buried pipe, double –wall pipe and equipment nozzles

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 conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of CAESAR II static and dynamic for experienced working engineers who are already familiar with Static Stress analysis using CAESAR-II program

Training Methodology

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Workshops & Work Presentations
30% Case Studies & Practical Exercises
20% Software, Simulators & Videos

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

Course Fee

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

Accommodation

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

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.

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. Dimitry Rovas, CEng, MSc, PMI-PMP, is a **Senior Mechanical Engineer** with extensive industrial experience in **Oil**, **Gas**, **Power** and **Utilities** industries. His expertise includes **ASME** Section Codes & Standards, **Boiler** Maintenance & Inspection, **Boiler** Operation, Instrumentation, Control & Troubleshooting, **Ferrous & Non-Ferrous Materials**, **Pressure Vessel** Design, Fabrication & Testing, Flaw Evaluation & Repair, Mechanical Design of **Pressure Vessel**, **Pressure Vessels & Piping** Maintenance, **Pressure Vessel** Inspection, **Vibration** Analysis, **Vibration** Monitoring, **Pump** Technology, **Pump** Selection & Installation, **Centrifugal Pumps & Troubleshooting**, **Reciprocating & Centrifugal Compressors**, **Compressor** Control & Protection, Modern **Valve** Technology, **Bearings & Lubrication**, Advanced **Machinery Dynamics**, Modern Heating, **Pumps & Valves** Maintenance & Troubleshooting, Ventilation, Air-Conditioning (**HVAC**) & Refrigeration Systems, **Pump & Compressors** Maintenance & Troubleshooting, **Compressors & Turbines** Troubleshooting, New Emergency **Air Compressors**, **Hydraulic** System Design & Troubleshooting, **Pipe Stress** Analysis, **Gas Conditioning & Processing**, **Process Plant** Optimization, Effective Production Operations in the Oil & Gas Fields, **Gas & Steam Turbines**, **Turbine** Operations, **Gas Turbine** Technology, **Gas Turbine** Erection & Commissioning (GE 9FA & GE9FB Units), Large Scale **Natural Gas Combined Cycle Power Plant** Projects (GE Equipment), Large Scale **Natural Gas Cogeneration** Plant Projects (GE & Siemens Equipment), **Gas Turbine** Condition Monitoring & Fault Diagnosis, Control & Operations of **Industrial Gas Turbines**, **Gas Turbine** Auxiliary System, **Gas & Steam Turbines**, **Turbine** Operations, **Gas Turbine** Technology, **Rubber** Compounding, Elastomers, **Thermoplastic**, **Industrial Rubber** Products, **Rubber** Manufacturing Systems, **Heat Transfer**, **Vulcanization** Methods, **Process Plant** Shutdown & Turnaround, Maintenance Optimization & Best Practices, **Maintenance Auditing & Benchmarking**, **Reliability** Management, **Rotating Equipment**, **Energy Conservation**, **Energy Loss** Management in Electricity Distribution Systems, **Energy Saving**, **Thermal Power Plant** Management, **Thermal Power Plant** Operation & Maintenance, **Heat Transfer**, **Machine Design**, **Fluid Mechanics**, **Heating & Cooling Systems**, **Heat Insulation Systems**, **Heat Exchanger & Cooling Towers**, **Mechanical Erection**, **Heavy Rotating Equipment**, Material Unloading & Storage, Commissioning & Start-Up, Process Safety Management (**PSM**), **HAZMAT & HAZCOM**, Laboratory Information Management System (**LIMS**) and Laboratory Quality Management (**ISO 17025**). Further, he is also well-versed in MS project & AutoCAD, EPC Power Plant, Power Generation, Combined Cycle Powerplant, Leadership & Mentoring, Project Management, Strategic Planning/Analysis, Construction Management, Team Formation, Relationship Building, Communication, Reporting and Six Sigma. He is currently the **Project Manager** wherein he is managing, directing and controlling all activities and functions associated with the domestic heating/cooling facilities projects.

During his life career, Mr. Rovas has gained his practical and field experience through his various significant positions and dedication as the **EPC Project Manager**, **Project Manager**, **GE 9FB Units Materials Manager**, **Field Engineer**, **Preventive Maintenance Engineer**, **Gas Turbine & Erection Engineer**, **Researcher**, **Instructor/Trainer**, **Telecom Consultant** and **Consultant** from various companies such as the Podaras Engineering Studies, Metka and Diadikasia, S.A., **Hellenic Petroleum Oil Refinery** and COSMOTE.

Mr. Rovas is a **Chartered Engineer** of the **Technical Chamber** of **Greece**. Further, he has **Master** degrees in **Mechanical Engineering** and **Energy Production & Management** from the **National Technical University of Athens**. Moreover, he is a **Certified Instructor/Trainer**, a **Certified Project Management Professional** (**PMP**), a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management** (**ILM**) and a **Certified Six Sigma Black Belt**. He is an active member of Project Management Institute (**PMI**), Technical Chamber of Greece and Body of Certified Energy Auditors and has further delivered numerous trainings, seminars, courses, workshops and conferences internationally.

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

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 - 0830	***PRE-TEST***
0830 – 0900	***Introduction***
0900 – 0930	***A Brief History of Stress Analysis***
0930 – 0945	*Break*
0945 – 1015	***Overview of Static Loads Design***
1015 – 1045	***Sustained Loads: Pressure & Weight Loads for Analysis***
1045 – 1115	***Temperature Cases & Cycles for Analysis***
1115 – 1145	***Overview of Dynamic Loads Design***
1145 – 1200	***Overview of Modal Analysis***
1200 – 1230	***Overview of Vibration Analysis***
1230 – 1245	*Break*
1245 – 1315	***Overview of Thrust Forces (Pressure Transients, Waterhammer)***
1315 – 1345	***Overview of Wind Design***
1345 – 1420	***Practical Session # 1***
1420 - 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Technical Basis of the ASME B31 Stress Equations for Piping Systems (B31.1, B31.3)***
0830 – 0900	***Technical Basis of the ASME B31 Stress equations for Pipelines (B31.4, B31.8)***
0900 – 0930	***Stress Intensification Factors***
0930 – 0945	*Break*
0945 – 1015	***Allowable Stress***
1015 – 1045	***Model Input for Static Analysis***
1045 – 1115	***Building the Model***
1115 – 1145	***Decoupling & Overlap Rules***
1145 – 1200	***Supports Models: Types & Stiffness***
1200 – 1230	***Static Analysis*** *Modeling and Analyzing of Fiberglass Reinforced Plastic Piping (FRP) • Modeling and Analyzing of Buried Piping • Modeling and Analyzing of Jacketed Piping • Modeling of Piping System together with Structural Support (in order to evaluate structural stiffness and its flexibility) with the help of 'structural steel modeler • Modeling of Various Types of Expansion Bellows*
1230 – 1245	*Break*
1245 – 1315	***Static Analysis Examples***
1315 – 1345	***Static Stress Analysis***
1345 – 1420	***Practical Session # 2***
1420 - 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

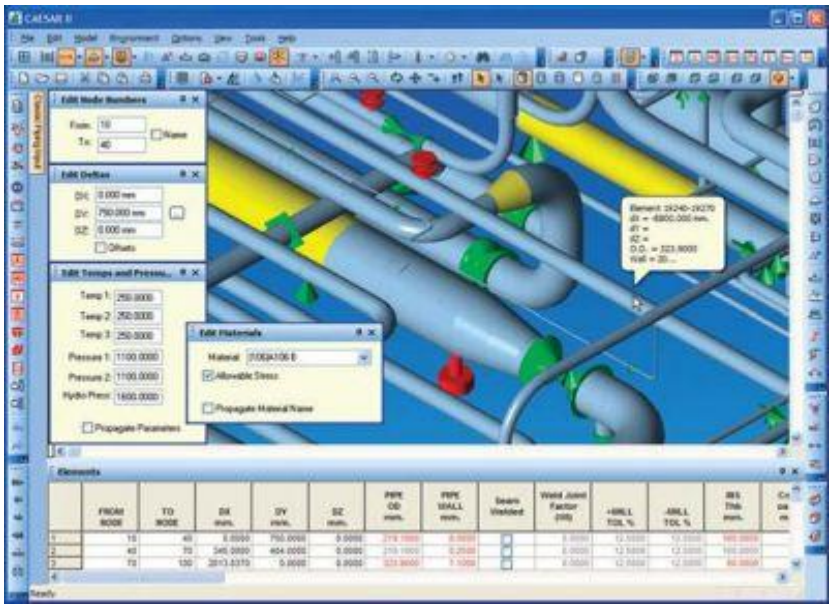
0730 – 0830	***Output***
0830 – 0900	***Displacement***
0900 – 0930	***Stress Limits***
0930 – 0945	*Break*
0945 – 1015	***Equipment Nozzle Loads***
1015 – 1045	***Support Loads & Displacements***
1045 – 1115	***Thermal Fatigue Analysis***
1115 – 1145	***Dynamic Analysis*** *Water Hammer/Slug Flow (Spectrum) Analysis • Relief Load (Spectrum) Analysis • Time History & Fatigue Evaluation of Piping • Pulsation Flow Analysis (Reciprocating Compressor Piping)*
1145 – 1200	***Dynamic Model & Modal Check***
1200 – 1230	***Support-Equipment Flexibility & Dynamic Coupling***
1230 – 1245	*Break*
1245 – 1315	***Vibration Analysis Examples***
1315 – 1420	***Practical Session # 3***
1420 - 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

0730 – 0815	***Transient Analysis Examples***
0815 – 0900	***Response Spectra Analysis Examples***
0900 – 0930	***Dynamic Qualification***
0930 – 0945	*Break*
0945 – 1015	***Other Analysis*** *Flange Leakage Analysis*
1015 – 1045	***Special Topics***
1045 – 1115	***Buried Pipe***
1115 – 1145	***Double-Wall Pipe***
1145 – 1215	***Equipment Nozzles***
1215 – 1230	*Break*
1230 – 1300	***Practical Session # 4***
1300 – 1345	***Summary Review***
1345 - 1400	***Course Conclusion***
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 the state-of-the-art "CAESAR II Software".



CAESAR II

Course Coordinator

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