



COURSE OVERVIEW ME0409

Piping Stress Analysis Training (CAESAR II Application)

Course Title

Piping Stress Analysis Training (CAESAR II Application)

Course Reference

ME0409

Course Duration

Five days/3.0 CEUs/30 PDHs



Course Date/Venue

Session(s)	Date	Venue
1	May 26-30, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
2	July 27-31, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
3	October 20-24, 2025	Glasshouse Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
4	December 21-25, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE

Course Description



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



Ensuring your plant's piping systems adhere to international codes and standards plays an integral role in keeping your plant operational. CAESAR II software makes it easy to input and display all the data needed to accurately define a piping system analysis model. It evaluates the structural responses and stresses of your piping systems to international codes and standards and enables you to access and modify, if necessary, input element by element or globally.



This course is designed to provide participants with a detailed and up-to-date knowledge on CAESAR II. It covers the software's basic features, applications and user interface; the setup, configuration and data input methods of CAESAR II; the fundamental concepts in pipe stress analysis; the piping codes, components and supports; the steel structure supports and sustained loads versus spring hanger design; the expansion joints design and analysis and flange assessment; the stress intensification factors for elbows and interconnections; the expansion loops and buried pipeline analysis; and the piping evaluation for fatigue due to seismic and wind loads and other occasional loads with static equivalents.





During this interactive course, participants will learn the local stresses in vessels and nozzles; the pump and nozzle flexibility according to API 610 standards; the RFP piping systems and transmission lines; the finite element analysis tools available in CAESAR II; the concepts learned in CAESAR II to real-world model analysis; the basic theory of dynamics in relation to CAESAR II; the harmonics analysis, spectral analysis, relief valve analysis, history analysis, seismic design and system responses evaluation; the flow induced vibration, impact load analysis and dealing with complex piping systems; and the common errors in pipe stress analysis and how to mitigate them.

Course Objectives

At the end of this course the Trainee will be able to fully utilize the CAESAR II software application:

- Apply and gain a comprehensive knowledge on Caesar-II software
- Understand the software's basic features, applications and user interface
- Set-up and configure CAESAR II as well as input data into the software
- Discuss the fundamental concepts in pipe stress analysis and how they are applied in CAESAR II
- Identify the various piping codes used in CAESAR II as well as the components and supports typically involved in pipe stress analysis
- Design and analyze steel structure supports in CAESAR II as well as differentiate sustained loads versus spring hanger design and the crucial concepts in pipe stress analysis
- Explore how to design and analyze expansion joints in CAESAR II and apply flange assessment
- Calculate and interpret stress intensification factors for elbows and interconnections
- Design and analyze expansion loops, analyze buried pipelines and evaluate piping for fatigue due to seismic and wind loads and other occasional loads with static equivalents
- Analyze local stresses in vessels and nozzles including pump and nozzle flexibility according to API 610 standards
- Model and analyze RFP piping systems and transmission lines as well as use finite element analysis tools available in CAESAR II
- Apply the concepts learned in CAESAR II to real-world model analysis and discuss the basic theory of dynamics in relation to CAESAR II
- Understand the different modes of vibration and how they are analyzed in CAESAR II
- Carryout harmonics analysis, spectral analysis, relief valve analysis, history analysis, seismic design and system responses evaluation



- Interpret flow induced vibration, conduct an impact load analysis and deal with complex piping systems
- Recognize the common errors in pipe stress analysis and how to mitigate them

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 for those who are involved with piping in the petroleum, chemical, power, gas transmission and related industries. Further, mechanical/design engineers, piping vessel maintenance engineers, engineering managers, piping designers, plant managers, draftsmen, new and experienced CAESAR-II users can benefit from this up-to-date, information-packed short course, whether they use other pipe stress programs – or don’t use any.

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.

Accommodation

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

Course Fee

US\$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.




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: -

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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.

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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 **3.0 CEUs** (Continuing Education Units) or **30 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.



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. Manuel Dalas MSc, BSc, is a **Senior Mechanical & Maintenance Engineer** with over **25 years** of industrial experience in **Oil, Gas, Refinery, Petrochemical, Power and Nuclear** industries. His wide expertise includes **Pipe Stress Analysis** using **CAESAR II, CAESAR II Application, Piping Dynamic, Static & Other Special Analysis** using **CAESAR II, Expansion Joints Design & Analysis, Impact Load Analysis, Piping Systems, Piping Codes** Used in **CAESAR II, RFP Pipe Maintenance & Repair, Relief Valve Analysis, Safety Relief Valve, Tanks & Tank Farms, Seismic Loads, Tank Shell, Tank Failure, Vacuum Tanks, Tank Design & Engineering, Tank**

Contractions, Material Cataloguing, Maintenance Planning & Scheduling, Reliability Centered Maintenance (RCM), Reliability Maintenance, Condition Based Maintenance & Condition Monitoring, Asset & Risk Management, Vibration Condition Monitoring & Diagnostics of Machines, **Vibration & Predictive Maintenance, Reliability Improvement & Vibration Analysis** for Rotating Machinery, **Effective Maintenance Shutdown & Turnaround Management, Engineering Codes & Standards, Rotating Equipment Maintenance, Mechanical Troubleshooting, Static Mechanical Equipment Maintenance, Machinery Failure Analysis, Machinery Diagnostics & Root Cause Failure Analysis, Plant Reliability & Maintenance Strategies, Boiler Operation & Water Treatment, Pumps Maintenance & Troubleshooting, Fans, Blowers & Compressors, Process Control Valves, Piping Systems & Process Equipment, Gas Turbines & Compressors Troubleshooting, Advanced Valve Technology, Pressure Vessel Design & Analysis, Steam & Gas Turbine, High Pressure Boiler Operation, Centrifugal & Positive Displacement Pump Technology Troubleshooting & Maintenance, Rotating Machinery Best Practices, PD Compressor & Gas Engine Operation & Troubleshooting, Hydraulic Tools & Fitting, Mass & Material Balance, Water Distribution & Pump Station, Tank Farm & Tank Terminal Safety & Integrity Management, Process Piping Design, Construction & Mechanical Integrity, Stack & Noise Monitoring, HVAC & Refrigeration Systems, BPV Code, Section VIII, Division 2, Facility Planning & Energy Management, Hoist - Remote & Basic Rigging & Slings, Mobile Equipment Operation & Inspection, Heat Exchanger, PRV & POPRV/PORV, Bearing & Lubrication, Voith Coupling Overhaul, Pump & Valve Technology, Lubrication Inspection, Process Plant Optimization, Rehabilitation, Revamping & Debottlenecking, Engineering Problem Solving and Process Plant Performance & Efficiency. Currently, he is the **Technical Consultant** of the **Association of Local Authorities of Greater Thessaloniki** where he is in charge of the mechanical engineering services for piping, pressure vessels fabrications and ironwork.**

During his career life, Mr. Dalas has gained his practical and field experience through his various significant positions and dedication as the **Technical Manager, Project Engineer, Safety Engineer, Deputy Officer, Instructor, Construction Manager, Construction Engineer, Consultant Engineer, Mechanical Engineer** and **CAESAR II Application Consultant** for numerous multi-billion companies including the **Biological Recycling Unit** and the **Department of Supplies of Greece, Alpha Bank Group, EMKE S.A, ASTE LLC** and **Polytechnic College of Evosmos**.

Mr. Dalas has a **Master's degree in Energy System** from the **International Hellenic University, School of Science & Technology** and a **Bachelor's degree in Mechanical Engineering** from the **Mechanical Engineering Technical University of Greece** along with a **Diploma in Management & Production Engineering** from the **Technical University of Crete**. Further, he is a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership and Management (ILM)**, a **Certified Project Manager Professional (PMI-PMP)**, a **Certified Instructor/Trainer**, a **Certified Energy Auditor for Buildings, Heating & Climate Systems**, a **Member of the Hellenic Valuation Institute** and the **Association of Greek Valuers** and a **Licensed Expert Valuer Consultant** of the **Ministry of Development and Competitiveness**. He has further delivered numerous trainings, courses, seminars, conferences and workshops internationally.



Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop 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 – 0930	Introduction to CAESAR II: Understanding the Software's Basic Features, Applications & User Interface
0930 – 0945	Break
0945 – 1030	Setup/Configuration/Data Input Methods of CAESAR II: Detailed Explanation of How to Set Up & Configure CAESAR II as well as How to Input Data into the Software
1030 – 1130	Introduction to Pipe Stress Analysis Basics: Fundamental Concepts in Pipe Stress Analysis & How They are Applied in CAESAR II
1130 – 1215	Piping Codes, Components & Supports: An Overview of the Various Piping Codes Used in CAESAR II as well as the Components & Supports Typically Involved in Pipe Stress Analysis
1215 – 1230	Break
1230 – 1330	Steel Structure Supports: A Detailed Look at How to Design & Analyze Steel Structure Supports in CAESAR II
1330 – 1420	Understanding Sustained Loads vs Spring Hanger Design: An In-depth Comparison Between These Two Crucial Concepts in Pipe Stress Analysis
1420 – 1430	Recap
1430	Lunch & End of Day One

Day 2

0730 – 0830	Expansion Joints Design & Analysis: Exploring How to Design & Analyze Expansion Joints in CAESAR II
0830 – 0930	Flange Assessment: An In-Depth Discussion on Flange Assessment in CAESAR II
0930 – 0945	Break
0945 – 1100	Stress Intensification Factors for Elbows & Interconnections: Understanding How to Calculate & Interpret Stress Intensification Factors
1100 – 1215	Expansion Loops: A Detailed Look at the Design & Analysis of Expansion Loops in CAESAR II
1215 – 1230	Break
1230 – 1330	Buried Pipeline Analysis: Exploring the Unique Considerations & Methods for Analyzing Buried Pipelines in CAESAR II
1330 – 1420	Fatigue Evaluation of Piping: Understanding How to Evaluate Piping for Fatigue Due to Seismic & Wind Loads & Other Occasional Loads with Static Equivalents
1420 – 1430	Recap
1430	Lunch & End of Day Two





Day 3

0730 – 0830	Local Stresses in Vessels/Nozzles: Learning How to Analyze Local Stresses in Vessels & Nozzles in CAESAR II
0830 – 0930	API 610 Analysis of Pump & Nozzle Flexibility: In-depth Analysis of Pump & Nozzle Flexibility According to API 610 Standards
0930 – 0945	Break
0945 – 1100	Modelling/Analysis of RFP Piping Systems & Transmission Lines: Detailed Explanation on Modelling & Analyzing RFP Piping Systems & Transmission Lines
1100 – 1215	Finite Element Analysis Tools & Mode Shapes: Introduction to the Finite Element Analysis Tools Available in CAESAR II & Understanding the Concept of Mode Shapes
1215 – 1230	Break
1230 – 1330	Model Analysis: Applying the Concepts Learned in CAESAR II to Real-World Model Analysis
1330 – 1420	Dynamics (Basic Theory): Understanding the Basic Theory of Dynamics in Relation to CAESAR II
1420 – 1430	Recap
1430	Lunch & End of Day Three

Day 4

0730 – 0830	Modes of Vibration: Understanding the Different Modes of Vibration & How they are Analyzed in CAESAR II
0830 – 0930	Harmonics Analysis: Exploring the Theory & Application of Harmonics Analysis in CAESAR II
0930 – 0945	Break
0945 – 1100	Spectral Analysis: Detailed Overview of Spectral Analysis in CAESAR II
1100 – 1215	Relief Valve Analysis: Learning About the Design & Analysis of Relief Valves using CAESAR II
1215 – 1230	Break
1230 – 1330	Time History Analysis & Seismic Design: Exploring the Application of Time History Analysis for Seismic Design in CAESAR II
1330 – 1420	Evaluation of System Responses: Understanding How to Evaluate System Responses in CAESAR II
1420 – 1430	Recap
1430	Lunch & End of Day Four

Day 5

0730 – 0830	Flow Induced Vibration: An Overview of Flow Induced Vibration & How It's Analyzed in CAESAR II
0830 – 0930	Impact Load Analysis: A Detailed Look at How to Conduct an Impact Load Analysis in CAESAR II
0930 – 0945	Break
0945 – 1100	Dealing with Complex Piping Systems: Strategies & Best Practices for Dealing with Complex Piping Systems in CAESAR II
1100 – 1215	Understanding & Mitigating Errors: Understanding Common Errors in Pipe Stress Analysis & How to Mitigate Them
1215 – 1230	Break

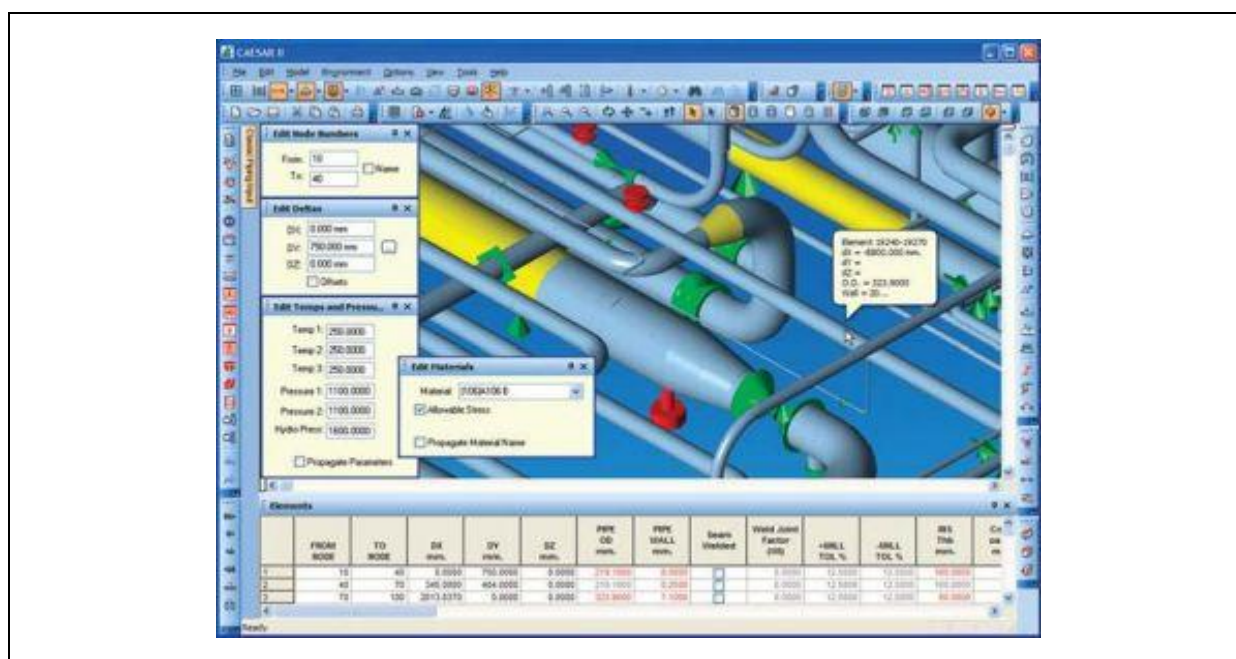




1230 - 1345	<i>Tips & Tricks for Efficient Use of CAESAR II: Sharing Some Insider Knowledge for Maximizing Efficiency in CAESAR II</i>
1345 - 1400	Course Conclusion
1400 - 1415	POST-TEST
1415 - 1430	<i>Lunch & End of Course</i>
1430	

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”.



Course Coordinator

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