

Training Title

**PIPE STRESS ANALYSIS TRAINING (CEASAR II APPLICATION)**

Training Duration

5 days

Training Dates & Venue

REF					
ME049	Pipe Stress Analysis (CAESAR II Application)	5	15-19 April 2024	\$5,500	Dubai, UAE

In any of the 5-star hotels. The exact venue will be intimated upon finalizing.

Training Fees

- \$5,500 per participant for Public Training includes very useful illustrative Materials/Handouts, tea/coffee breaks, refreshments, Break Fast, and an international Buffet Lunch each day.

Training Certificate

Define Management Consultancy & Training Certificate of course completion will be issued to all attendees.

TRAINING OVERVIEW

TRAINING DESCRIPTION

Piping Stress Analysis involves examining the flexibility and stiffness of a particular piping configuration under different types of loading, primary and secondary types. Piping Stress Analysis determines the maximum stresses in the piping system and suggests necessary modifications. Less flexible systems are susceptible to failure more. Stress analysis helps revising the piping layout and its supports to avoid high local stresses. The course will discuss different types of stresses affecting piping flexibility, code criterions and methods of analysis, simple methods and computerized methods. Participant will practice performing such analysis using one of the software's for the same.

WHO SHOULD ATTEND

Engineers who are responsible for performing piping system stress analysis and others who must have a good understanding of its requirements are invited to attend this course.

COURSE OBJECTIVES

Upon completion of this course, attendees will be able to apply the piping system stress analysis requirements of ASME B31.3 to process plant piping systems and understand how to use piping analysis software to meet these requirements.

WHO SHOULD ATTEND

Engineers who are responsible for performing piping system stress analysis and others who must have a good understanding of its requirements are invited to attend this course.

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## **TRAINING METHODOLOGY**

A highly interactive combination of lectures and discussion sessions will be managed to maximize the amount and quality of information and knowledge transfer. The sessions will start by raising the most relevant questions and motivate everybody to find the right answers. The delegates will also be encouraged to raise their own questions and to share in the development of the right answers using their own analysis and experiences.

- 30% Lectures
- 30% Workshops and work presentation
- 20% Group Work& Practical Exercises
- 20% Videos& General Discussions

## **COURSE OUTLINE**

### **Ch 1 Piping System Layout, Supports, and Restraints**

Introduction  
General System Layout Considerations  
Layout Considerations for Specific Piping Systems  
Support and Restraint Considerations  
Types of Pipe Support  
Estimating Maximum Permitted Support Span  
Estimating Loads at Supports  
Types of Pipe Restraints

### **Ch 2 Engineering Mechanics of Piping**

Piping Criteria  
Stress Categories:  
    Primary and Secondary Stresses  
Classification of Loads  
    Primary loads  
    Sustained loads  
    Occasional loads  
    Expansion loads  
Allowable Stress Range for secondary Stresses  
Stress Acting on Piping Elements  
Stress Calculations  
Code Stresses

### **Ch 3 Piping Flexibility and Stiffness**

Introduction  
Fundamentals  
Flexibility Analysis  
Identifying Lines with Adequate Flexibility  
Stiffness and Large Piping  
Flexibility Method  
    Pipe Offsets and Loops  
    Expansion Joints

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Pipe Restraints and Anchors  
Criteria for Flexibility Analysis  
Level of Piping Flexibility Analysis  
Simplified Flexibility Analysis Methods  
Computerized Piping Flexibility Analysis  
Special Considerations for Specific Piping Systems

#### **Ch 4 Piping Vibration**

Introduction  
Basic Concepts  
Fatigue Stress and Other Failure Considerations  
Types of Vibration Analysis  
Common Causes of Piping Vibration  
Vibration Measurement  
Screening Vibration Problems  
Vibration Control  
Overall Design Considerations

#### **Ch 5 Piping Support Systems for Process Piping**

Spring Supports  
    Variable Springs  
    Constant Springs  
Piping Nozzle Loads on Rotating Equipment  
    Pump Nozzle Loads  
    Compressor Nozzle Loads  
Piping System without Springs  
Fluid Forces Acting on Piping Systems  
Nozzle Movements and Thermal Displacement  
Case Studies

**All the above concepts and methods will be examined through pipe modeling using a Piping Stress Analysis Program. (CAESAR II Application)**

**NOTE:**

**Pre & Post Tests will be conducted**

**Case Studies, Group Exercises, Group Discussions, Last Day Review & Assessments will be carried out.**

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