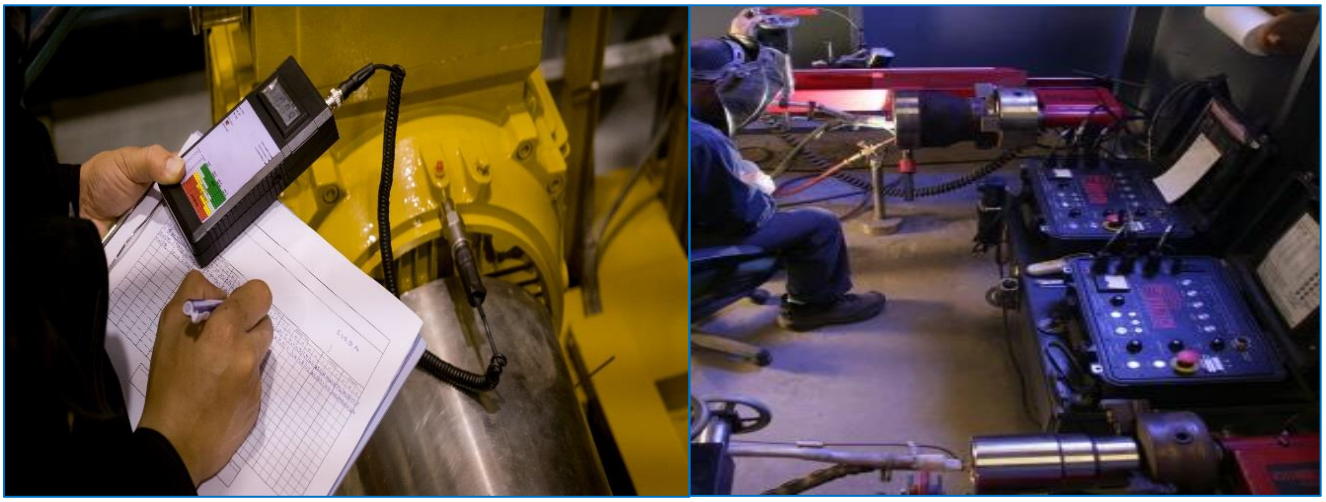
Tel No:+97126654546 | FaxNo:+97126654182 | Email: training@cmc-me.com | www.cmc-me.com



# FE143:
# Vibration Analysis & Practical Solutions

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## Training Description:

This intensive training course provides a thorough review of a wide variety of causes of piping vibration from the point of view of an engineer that must identify the cause of vibration, determine if vibration is excessive, and correct the problem if it is. It provides a background on fundamental causes of piping vibration and how to identify source of vibration, rules of thumb and simplified methods for evaluating vibration severity, and methods of treatment.

A wide variety of causes of vibration are covered in order to enable the course participant to properly evaluate the variety of piping vibration problems that can occur in piping systems. The causes of vibration, where possible, are discussed with respect to very basic energy and momentum principles that enable the participant to understand what is happening within and to the piping system. Screening and simple vibration limits are provided.

Many actual examples of typical plant piping vibration problems that the course instructor has solved are reviewed to illustrate the concepts covered. In addition, participants are encouraged to bring examples of troublesome vibration problems they have experienced or are experiencing in their plants for class discussion.

## Training Objectives:

By the end of the training, participants will be able to:

- ✓ Analyze the vibration of piping system and implement the correct predictive maintenance method
- ✓ Discuss the concepts of mechanical vibration including high frequency vibration and learn what acoustic resonance is as well as its application on piping vibration analysis
- ✓ Identify the parts of the reciprocating compressor systems and be able to review its features and functions
- ✓ Describe what an acoustic fatigue is and become familiar with the concept of slug flow and surge including their features
- ✓ Distinguish piping systems with reciprocating pumps and recognize their role on vibration analysis
- ✓ Determine the other sources of vibration and be able to learn their features and application
- ✓ Improve the practical methods for evaluating piping vibration using simple rules and recognize their importance in piping vibration analysis and practical engineering solutions
- ✓ List down the various piping restraints and have a good overview of the different solutions to vibration problems
- ✓ Demonstrate sample piping vibration problems to become more acquainted on the techniques of piping vibration analysis and its engineering solutions
- ✓ Present case studies and practical sample scenarios to further understand the concepts of vibration analysis in piping

## Training Designed for:

This course is intended for engineers who are responsible for operating existing piping systems. However, designers of new piping systems will also find the broad coverage of potential vibration problems a time saving briefing on the variety of vibration problems that can occur in piping systems.

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## Training Program:

***DAY ONE:***

- Introduction
- Vibration Fundamentals & Definition
- Mechanical Vibration Concepts
- Recap

***DAY TWO:***

- Source of Piping Vibration
- Flow Induced Vibration
- Slug Flow (Water Hammer)
- Recap

***DAY THREE:***

- Surge (Pressure Wave Water Hammer)
- Piping Vibration Involving Control Valves
- Other Sources of Vibration
- Recap

***DAY FOUR:***

- Practical Methods for Evaluating Piping Vibration
- Acceptance Criteria (ASME B31 Series)
- Methods of Piping Vibration Damping
- Recap
- Practical Sessions
  - This hands-on, highly-interactive training includes real-life case studies and exercises

***DAY FIVE:***

- Sample Piping Vibration Problems
- Case Studies
- Open Session with Student Vibration Problems
- Course Conclusion
- POST-ASSESSMENT and EVALUATION

## Training Requirement:

"**Hand's on practical sessions, equipment** and **software** will be applied during the course if required and as per the client's request".

Practical sessions will be organized during the course for participants to practice the theory learnt. Participants will be provided with an opportunity to carryout various exercises using the **state-of-the-art** simulator "**iLearnVibration**".

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client's learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

## Training Methodology:

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

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

## Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

## Training Fees:

**TBA as per the course location -** This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

## Training Timings:

**Daily Timings:**

| | |
|---|---|
| 07:45 - 08:00 | Morning Coffee / Tea |
| 08:00 - 10:00 | First Session |
| 10:00 - 10:20 | Recess (Coffee/Tea/Snacks) |
| 10:20 - 12:20 | Second Session |
| 12:20 - 13:00 | Recess (Prayer Break & Lunch) |
| 13:00 - 14:00 | Last Session |

**For training registrations or in-house enquiries, please contact:**

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