ENGINEERING STAFF COLLEGE OF INDIA

Autonomous Organ of The Institution of Engineers (India)
(IMS [ISO 9001:2015, ISO 14001:2015, ISO 50001:2018, ISO 45001:2018],
ISO/IEC 17025:2017 Certified, AICTE & CEA Recognized Institution)
Old Bombay Road, Gachibowli, Hyderabad – 500 032. Telangana, India

Management and Technology Division

Hybrid (Offline & Online) Continuing Professional Development Programme on

Vibrations, Balancing, Alignment and Condition Monitoring of Rotating Equipment

(Theory and Practical Orientation with Technical Site Visit)

Dates: 21 – 25 April 2025

at ESCI Campus, Hyderabad

INTRODUCTION

Vibration refers to mechanical oscillations about an equilibrium point. The oscillations may be periodic such as the motion of a pendulum or random such as the movement of a tire on a gravel road. More often, vibration is undesirable, wasting energy and creating unwanted sound pollution. For example, the vibrational motions of engines, electric motors, or any mechanical device in operation are typically unwanted. Such vibrations can be caused by imbalances in the rotating parts.

Imbalances in rotating parts are caused by unequal radial mass distribution on a rotor system, a shaft condition where the mass centerline does not coincide with the geometric centerline. Also the effective mass causes the rotor to be out of balance. Other reasons may be uneven friction, the meshing of gear teeth, etc.

Alignment also plays an important role in the health of the rotary equipment. While carrying alignment Skill, time management and place plays a vital role in upkeep, availability and reliability of the rotating equipment.

The Asset Effectiveness relates to extracting maximum profits from the minimum investment in plant and equipment, improving Equipment Reliability through the effective prediction (and then avoidance) of equipment failures and minimizing downtime through the integrated planning and scheduling of repairs indicated by Condition Monitoring techniques with those indicated by other techniques. The present programme aims at addressing the above issues.

OBJECTIVES

The objective of the programme is to impart thorough understanding of the vibrations, balancing and alignments issues in rotating machinery and enhance their trouble shooting skills and monitoring the conditions of the rotating machinery equipment among practicing engineers and managers.

COURSE COVERAGE

The following course content will be detailed during the training programme:

- **Vibration Basics**
- **Basic fundamentals of Rotating Machines**
  - Effect of Lubrication on performance
  - Type of Maintenance Plans, Breakdown, Preventive and Predictive
  - Effect of Misalignment and need for Precision Laser alignment
- **Fundamentals of Vibration Analysis**.
  - Vibration Signature
  - Advances in Vibration Measurements
- **Condition Monitoring Techniques such as, Wear Debris Analysis, Ferrography, Shock Pulse Methods etc.**
  - Condition Monitoring of Power Plant Auxiliary System
  - Modern Trends in Condition Monitoring with a Case Study
- **Fault Identification in rotating machinery using vibration analysis**
- **Managing precision maintenance program**

and Testing
    - Case studies in Vibration
- **Balancing**
    - Static
    - Dynamic
- **Alignment :** Vertical Alignment Procedures
- **Case studies in rotary equipment such as pumps, turbines and compressors**
- **Failures and the factors which promote the failures, failure mechanisms case studies.**
- **Power Quality industrial case studies**
- Power Quality Impacts in solar & wind renewable energy systems
- Group discussions. Experience sharing

METHODOLOGY

Methodology of the programme includes class room Sessions with Lecture/discussion with audio visual aid, benched marked practices if any, video shows, Chalk & Talk sessions, group discussions, case studies, debates, sharing of experiences, etc. All the sessions will be interactive demanding active participation from all the members. Case Method of Instructions will be the main method of knowledge facilitation.

TARGET PARTICIPANTS

Engineering Managers, Engineers, Executives, supervisors Quality Personnel and Inspection Engineers and managers involved in operation and maintenance of power generation units (Thermal, Gas, Hydro), refineries, fertilizers, petrochemicals and steel mills would be largely benefited by attending this programme. Professors from Engineering Colleges and any interested individual may also attend the programme.

EXPERT FACULTY

The faculty consists of experts from industry, Entrepreneur and academia, besides that from ESCI.

PROGRAMME DIRECTOR

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PROGRAMME DATES & TIMINGS

Dates: 21 – 25 April 2025

Timings : On the first day Registration will commence at **09:00 Hrs**. On all other days the programme timings will be from **09:45-17:15 Hrs** with breaks in between for tea & snacks.

COURSE FEE: Rs.27,000/- (Rupees Twenty Seven Thousand only) per Participant + GST@18% Extra. Fee includes, course material, course kit, twin-sharing/single AC accommodation as per availability, breakfast, lunch, dinner, tea / coffee and snacks during the actual days of training programme.

Online: WebEx platform.
Rs. 15,000 /- (Rupees Fifteen Thousand only) per participant + GST@18% Extra.

Note: GST Nil for Central Govt. Departments (like DRDO, DGQA & Govt. Departments).

PAN Card No AAATT3439Q; GST No. 36AAATT3439Q1ZV. **H.S. No. 999293** (Under commercial training or coaching services – clause 65(105) (ZZC) of Finance act – 1994).

Programme fee is to be paid in in favor of **"THE INSTITUTION OF ENGINEERS (INDIA) – ENGINEERING STAFF COLLEGE OF INDIA"** in the form of demand draft payable at Hyderabad. Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - **SB A/c No.0432104000039631 with The IDBI Bank Ltd., Gachibowli Branch, Plot No. 2-53/2, JNIBF, IIIT Junction, Gachibowli, Hyderabad-500032 by RTG's/ NIFT / IFSC Code No: IBKL0000432.** While using EFT method of payment, please ensure to communicate us your company name, our Invoice reference and programme title.

CERTIFICATION

A Certificate of participation will be awarded to each participant on conclusion of the programme.

GENERAL INSTRUCTIONS:

- ESCI encourages participants to present case studies from their respective organizations.
- ESCI provides complimentary accommodation and boarding to the participants one day before commencement (Check-in 1200 h) and one day after conclusion (Check-out 1200 h) of the programme duration. Overstay charges will be applicable as per ESCI rules (subject to availability of accommodation).
- Well-developed Information Centre and Internet facilities are available to the participants free of cost.

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