



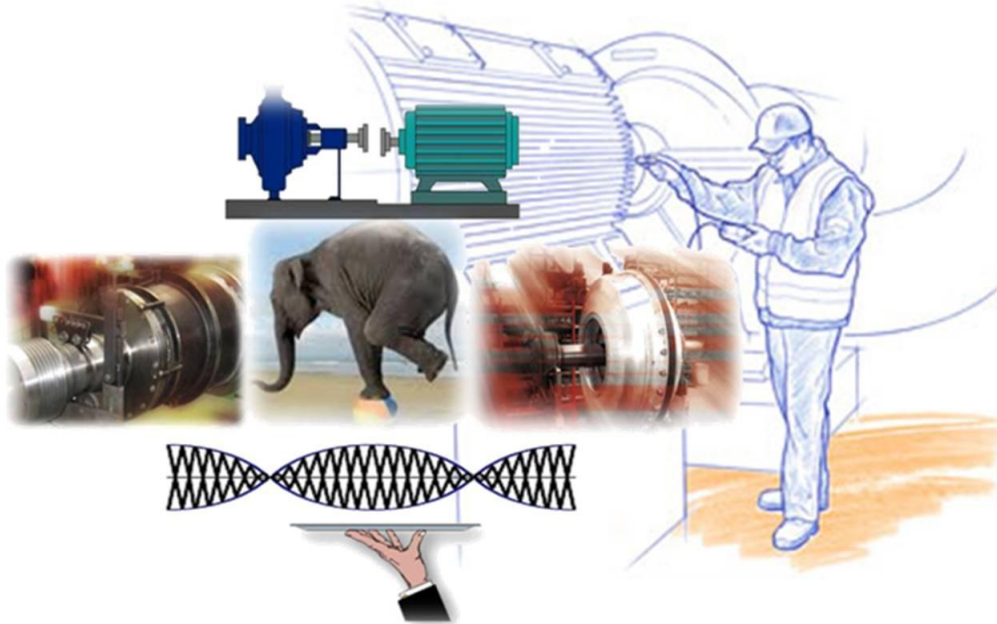
**Engineering Staff College of India**  
Autonomous Organ of The Institution of Engineers (India)  
(An ISO 9001:2008 Certified, AICTE & CEA Recognized Institution)  
Old Bombay Road, Gachi Bowli, Hyderabad – 500 032TS India



**Management and Technology Division**

*Professional Development Programme*

**Vibrations, Balancing, Alignment and Condition Monitoring  
of Rotating Equipment  
(Theory and Practical Orientation with Technical Visit)  
16-19 January 2018**



(An ISO 9001:2015 Certified, AICTE & CEA Recognized Institution)

**Centre for Promotion of Professional Excellence**

## 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 placeplays 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 attending to above issues.

## OBJECTIVE

The objective of the programme is to impart thorough understanding of the vibrations, balancing, 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 topics that would be deliberated are:

- **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 and Testing
  - Case studies in Vibration
- **Balancing**
  - Static
  - Dynamic
- **Alignment**
  - Vertical Alignment procedures
- **Condition Monitoring Techniques such as, Wear Debris Analysis, Ferrography, Short Pulse Methods etc**
  - Modern Trends in Condition Monitoring with a Case Study
- **Fault Identification in rotating machinery using vibration analysis**
- **Case studies in rotary equipment such as pumps, turbines and compressors**
- **Failures and the factors which promote the failures, failure mechanisms case studies.**
- **Technical Visit (Conditioning Monitoring Solutions), for live demonstration.**
- Group discussions. Experience sharing

## METHODOLOGY

Methodology of the programme includes class room Sessions with Lecture/discussion with audio visual aid, benched marked 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. CMI will be the main method of instruction. Technical Field visit to a leading manufacturer of rotating machineries or vibration monitoring and analyzing establishment or instrument manufacturer is also planned to give live demonstration and updates.

## FACULTY/ RESOURCE PERSONS

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



**Mr. AChandra Mohan Rao,**  
Sr Faculty Head Power & Energy Division,  
ESCI



**Dr A Rajamani**  
Formerly worked in BHEL (R&D) HoD, IT & Dean,  
Aurora Engineering College, Bhongir.

## 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.

## BENEFIT TO THE PARTICIPANTS.

- The participants will learn unique characteristics of Vibrations, Balancing and Alignment, measures to effectively monitor and control them in rotating machinery and will be exposed to latest instrumentations techniques to improve the availability and reliability of High Speed rotating machines to meet their target productions.
- The programme intends to update and enhance the knowledge & trouble shooting skills of practicing Engineers.

- Awareness to contemporary concepts and practices.
- Programme will provide unique platform to develop networking and sharing of experiences from fellow participants and faculty even after the completion of programme.

## PROGRAMME VENUE, DATES & TIMINGS

### Venue:

Engineering Staff College of India(ESCI) Campus, Old Bombay Road, Gachi Bowli, Hyderabad. 500032. AP, India.

### Dates

16-19 January 2018

### Timings

On the first day Registration will commence at 0900 hrs. On all other days the programme timings will be from 0945-1715 h with breaks in between for tea and lunch.

## COURSE DIRECTOR



**Gp Capt BS Phillora**BE(ETC), AE (L), MMS (DS), M Phil, FIE, Certified Lead Auditor  
**Dean of Studies &**  
**Sr. Faculty & HoD Management & Technology Division ESCI**

## COURSE FEE

₹ 20,000/-(**Residential Fee**) per participant. 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.

## DISCOUNTS

- **Non-Residential Fee-** 10% discount on course fee is allowed for non-residential participants.
- **Group Discount:** Additional 10% discount for 03 or more participants, if sponsored by the same organization.

**(All discounts are applicable only if fee is received at ESCI before the commencement of the programme.)**

Service Tax as applicable (w.e.f. 01 Jun 16 @15%) is to be paid extra over and above the training fee, as training is also brought under the purview of Service Tax in Finance Bill 2010. PAN Card No AAATT3439Q; Service Tax registration No AAATT3439QST008. (Under commercial training or coaching services- Clause 65 (105) (ZZC) of Finance act 1994)

Programme fee is to be paid in favour of “**IE (I)-Engineering Staff College of India**” in the form of demand draft payable at Hyderabad at par cheques payable at any Bank Branches.

Alternatively, the payment may be made by Electronic Fund Transfer (EFT) to ESCI - **SB A/c No.0432104000039631 with The IDBI Bank Ltd., Gachi Bowli Branch, Diamond Park, Plot No.81, Vinayak Nagar Colony, Gachi Bowli, Hyderabad-500032 by RTG's/ NIFT / IFSC Code No: IBKL0000432. ESCI PAN No. is AAATT3439Q and Service Tax Regn. No. AAATT3439Q ST008.**

**While using EFT/ Draft method of payment, kindly forward a covering letter giving details on the names of the participants, Title and the programme schedule so that proper accounting can be done.**

## Registration

Online registration shall be available on ESCI website. URL: [www.escihyd.org](http://www.escihyd.org) (Domain Management & Technology)

To register, manually please send your nominations giving details of name, designation, contact address, email address, mobiles no, telephone and fax number of the participant along with the details of mode of payment of fee, addressed to:

### Head, Management & Technology Division

EngineeringStaffCollege of India  
 Old Bombay Road, Gachi Bowli, Hyderabad 500 032  
 Phone: 040 6630 4111/6630 4112 & 6630 4128  
 Fax : 040-23000336/ 040 66304103

Email : [mt@escihyd.org](mailto:mt@escihyd.org)

## Certification

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

## General Information

- ESCI encourages participants to present case studies from their respective organizations.
- For the convenience of outstation participants, ESCI will facilitate pick-up and drop from Airport / Railway Stations / Bus Stations, if travel plans are received at least 3 days in advance along with mobile number by fax or email. The charges shall be paid by the participant directly to the Cab.
- 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.

**Nominating authorities are requested to kindly send the contact details of the participants while sending their nomination letter. This will help us in making necessary administrative arrangement for them.**



### For Registration Please Contact:

Mr. LV Rao  
 Programme Manager,  
 Land line 040 66304112  
 Mob: 0 : 09949145865