Course Overview:

This highly relevant Seminar is intended for maintenance and machinery engineers,supervisors, technologists and technicians involved in machinery operation, maintenance,condition monitoring and troubleshooting. Because the methods and examples are generic,personnel from all industries will benefit.The course can be used as an introduction to the field of failure analysis and prevention forthose wishing to specialize in this area, or as an update of the key aspects of the field forthose who already work in this area.

Course Objective:

The course presents a systematic approach to fault diagnosis and failure prevention. Itfirstly adopts a general approach to machine deterioration, the mechanisms involved andthe ways in which common deteriorative modes can be combated. It then turns tocomponent-oriented studies of failure mechanisms in common items of plant. For eachcomponent type or machine system, the on-line and off-line symptoms of deterioration arepresented, with significant emphasis being placed upon an inspection-based approach.Statistical methods of failure analysis are presented and examples are used to demonstratebest practice in the collection, analysis and interpretation of such data. Finally, the coursedwells upon the use of condition monitoring methods in a failure analysis and preventionrole, and in particular upon the use of machinery vibration monitoring and analysis.Upon completion of this course, participants will gain an understanding of structured,results-oriented failure analysis methods for all types of machine components and entiremachinery systems. Participants will learn how parts fail, why they fail in a given mode, theon-line and off-line symptoms of failure, and general failure prevention methods.Participants will learn how to collect, analyze and interpret failure statistics and will alsogain an understanding of FMECA. Participants will be instructed in condition monitoringmethods and will be taught how vibration analysis can be used to detect, locate, severityassess and diagnose a range of common faults in rotating and reciprocating machines.

Course Outline:

1. INTRODUCTION1.1. Meaning of a mechanical failure1.2. Monitoring of the failure1.3. Importance of mechanical failure analysis1.4. Relation between failure and material depreciation1.5. Machine depreciation rate curves2. EXAMPLES ON MACHINEARY FAILURE2.1. Centrifugal pump operation2.2. Pump performance curves2.3. Pump failure and diagnosis2.4. Centrifugal pump trouble shooting2.5. Rotary pump trouble shooting2.6. Causes of failure and its prevention2.7. Performance deterioration2.8. Cavitations of pumps and its effect on performance2.9. Monitoring performance during inspection3. DEFINITIONS OF MISALIGNMENT CONDITIONS & HOW TO ACCURATELY4. DETERMINE THESE USING DIAL TEST INDICATORS FOR 'FACE & PERIPHERY'AND 'REVERSE ALIGNMENT' TECHNIQUES.5. HOW TO POSITION OFFSETS TO ALLOW FOR THERMAL & DYNAMIC GROWTHOF MACHINE CASINGS6. PREPARING ALIGNMENT RECORDS & REPORTS7. ALIGNMENT OF MACHINE SHAFTS USING MODERN LASER ALIGNMENTEQUIPMENT, PRAC

Who Should Attend:

Mechanical, Operation, Production, and Maintenance Engineers Senior Technicians, whowork in power utilities, should benefit from this course. Also Senior Engineers shouldupdate and refresh their knowledge by attending this course.

Training Language:

EN / AR

Training Methodology:

- Presentation & Slides
- Audio Visual Aids
- Interactive Discussion
- Participatory Exercise
- Action Learning
- Class Activities
- Case Studies
- Workshops
- Simulation