STEAM TURBINE: DESIGN, OPERATION AND MAINTENANCE

Presenter: Fred Geitner

ABOUT THE PRESENTER: FRED GEITNER  P.ENG

Mr. Geitner is presently the principal engineer of PMES (Process Machinery Engineering Services), an independent consultant and expert litigation witness in the area of process machinery reliability. He has over 40 years experience in the design, operation, maintenance and troubleshooting of compressors used in process plant and transmission pipeline applications. He is a registered professional engineer in the Province of Ontario, Canada.

He has given depositions as an expert witness, has conducted plant site reliability audits and also presented courses and seminars covering process machinery design, operation, maintenance and reliability issues in Canada, United States, South America, Europe, Pakistan and the Middle East.

Together with H.P. Bloch he co-authored several books on process machinery management and reliability assurance.

Co-author:
- Machinery Component Maintenance and Repair (2nd Ed., 2001)
- Maximizing Machinery Uptime (2nd Ed., 2006)
- COMPRESSORS - How to Achieve High Reliability & Availability (1st Ed., 2012)

Number of days: 3
Cost: R12 500
CPD Points: 3

COURSE DESCRIPTION

Steam Turbines of several types, which have widely varying configurations and applications, are used extensively in the process industries. These steam turbines represent a significant part of the capital and operating costs of most plants, so that optimizing their selection is of major economic importance.

The course is devoted to design features, efficiencies, operating characteristics, reliability, and maintenance implications of steam turbine drivers.

This course will cover the operating principles of steam turbines, specifications, their design, thermodynamics, effect of efficiency on operating costs, energy usage, effect on plant costs, special materials of construction, selection, troubleshooting, and maintenance. The course will also cover plant run-length extension surveys, organizing for successful turnarounds and ongoing reliability improvement, and preventive vs. predictive maintenance strategy decisions.

The course will provide the participant with a basic, as well as advanced, steam turbine technology inventory required to successfully select, apply, troubleshoot, and maintain steam turbine equipment.

WHO MUST ATTEND

Persons in staff (senior technicians, operators, supervisors, superintendents) and corporate engineering, plant planning and design, systems designs, equipment selection and evaluation, and equipment maintenance areas. Also, equipment and systems specialists in engineering contractor firms and managerial and supervisory individuals responsible for operations and maintenance functions.

The industries most directly involved with the subject matter are those producing chemicals, petrochemicals, petroleum products, natural gases, manufacturing gases, steel, and plants requiring process refrigeration. Throughout the courses, participants will have ample opportunity to have equipment-related questions answered by the instructor.
COURSE OBJECTIVE

Upon completion of this course, participants will have gained a thorough understanding of the various steam turbine configurations available to virtually every industrial user. Items discussed include mechanical design features, sizing and application criteria, maintainability, reliability, vulnerability, and troubleshooting issues. Participants will learn simple techniques and short-cut methods of machinery selection, which can take the place of tedious hand calculations and will serve as rapid means to determine sensitivity or influence of parameter changes on equipment performance. Participants will be able to determine the most appropriate and efficient matching of compressor or pump to steam turbine driver. Participants will also acquire knowledge of operating and maintenance issues by getting to know mechanical design, machinery components, piping design, as well as proven approaches to monitoring, troubleshooting, and maintenance of compressor installations.

COURSE OUTLINE

**DAY 1**
- Steam Turbines
  - Operating Principles, Impulse Turbines, Reactions Turbines, Application Ranges, Configurations, Application Constraints
- Turbine Components
- Overview of Selection and Sizing of Steam Turbines for Reliability
  - Thermodynamics, Steam (Water) Rates, Condensing and Backpressure Turbines, Single and multistage Types, Process Considerations.
- Operation and Maintenance of Steam Turbines
  - Commissioning, Start-Up, Run-In and Shut-Down, Surveillance and Health Monitoring, Performance Measurement, Monitoring and Tracking, Steam Turbine Washing, Steam Turbine Inspection, Maintenance, Overhaul and Repair (IMO&R)

**DAY 2**
- Basic Approaches to Machinery
  - Examples from Recent Failure Incidents Attributed to Design Defects, Processing and Manufacturing Deficiencies, Assembly Errors, Off-Design or Unintended Service Conditions, Maintenance Deficiencies, etc.
- Predictive vs. Preventive Maintenance Techniques
  - Determination of Which Method to Use
- Machinery Reliability Audits and Reviews
  - Overview, Reliability Impact on Plants
- Possible Modifications
  - Life extension, rerating and uprating, and revamp efforts of mechanical drive steam turbines (20 to 100,000 HP)
Registration Form

Number of days: 3  
Cost: R12 500 excl VAT  
CPD Points: 3

How to register for the course:

1. Complete this registration form and fax it to Phindi Mbedzi: Tel: 011 325 0686 Fax: 011 325 0488 Email: Phindi@2kg.co.za
2. Acknowledgement will be emailed to you.
3. Final confirmation and details will be faxed or emailed to you approximately 7 days before the commencement of the seminar.

Cancellation Policy:

By signing and returning the registration form, the authorizing signatory on behalf of the stated company is subject to the following terms and conditions:
- All cancellations must be received in writing
- Any cancellations received less than 3 working days before the date of the event, the full fee will be payable and no refunds or credit notes will be given.
- If a registered delegate does not cancel and fails to attend the Workshop, this will be treated as a cancellation and no refund or credit note will be issued.

Delegate information:

Title: _______  Surname: ___________________________  Name: ___________________________
Full Company name: ___________________________  Job Title: ___________________________
Postal Address (to which invoice must be sent):

Code: ____________________  VAT number: ____________________
Tel: (          ) ______________  fax: (          ) ______________
Cell: _____________________  Email: _____________________

Contact/ Accounts information:

Title: _______  Surname: ___________________________  Name: ___________________________
Tel: (          ) ______________  fax: (          ) ______________
Cell: _____________________  Email: _____________________

Dietary Requirements:  
- Normal  
- Vegetarian  
- Halaal

Accommodation Requirements:  
- Yes  
- No

Please tick the course that you would like to attend:

☐  20-22 February 2017  
Durban

I have read and agreed to all the conditions of registration as stipulated in this brochure.

______________________________________________________
Signature  Date

For more info and to register contact Phindi Mbedzi on tel: 011 325 0686 or cell: 071 125 6188 and email: Phindi@2kg.co.za or visit www.2kg.co.za