

CENTRIFUGAL PUMPS

THEORY, DESIGN, OPERATIONS & MAINTENANCE

21~22 MAY 2008, SHAH VILLAGE HOTEL, PETALING JAYA



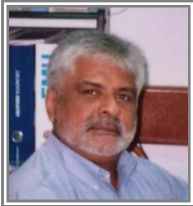
OBJECTIVE

The course is designed for participants who have basic knowledge of pumps. Pumps have been said to be the foundation of all industries. It has also been said pumps consume about 20% of all the energy generated throughout the world. This course is also designed to introduce the participants to the various pump terminologies frequently used, the various types of pumps used, the various parts and to some basic design. The overall objective is to give the participants a functional knowledge of basic pump theory.

Participants are advised to bring along their scientific calculators.**

The FACILITATOR

ENGR. N. JAYASEELAN MIEM, MIET, MASME
BEng(Hons) Mech Eng (UMalaya), HND(Mech) Leeds Poly, UK



ENGR. N. JAYASEELAN obtained his Higher National Diploma in Mechanical Engineering from Leeds Polytechnic (UK) and subsequently a Bachelor Degree (Honours) in the same discipline from the University of Malaya.

He was one of the recipients of a scholarship awarded by the Association of Overseas Technical Scholarships (AOTS) from the Ministry of Economy, Trade and Industry of Japan to attend a course on pumps which was organized by the Ebara-Hatakeyama Memorial Fund in collaboration with the Association of Consulting Engineers Malaysia (ACEM).

He has about 25 years of working experience in various industries, which includes building maintenance, foundry, water and sewerage industries, etc. He has vast theoretical and practical knowledge on pump design, selection, installation, operation, maintenance and trouble-shooting.

The BENEFITS of this COURSE

- > A thorough explanation on the function of pumps.
- > A detail theory with a practical approach of pumps will be discussed.
- > A presentation on the various types of pumps and their respective applications.
- > The various pump terminologies will be discussed in detail.
- > Pump theory, design, selection and operations will be discussed.
- > Approved course by the **Board of Engineers, Malaysia**.

The PROGRAMME DAY 1

- 08.30 Registration
- 09.00 **SESSION 1 - INTRODUCTION**
- Definitions of head, calculations, K-factors;
 - Definition of capacity, calculations, flow
 - Piping design:- Parts 1, 2, 3 and 4
- 10.00 Refreshment
- 10.30 **SESSION 2 –NET POSITIVE SUCTION HEAD, SPECIFIC HEAD**
- Types of pumps
 - Calculation of NPSH
 - Suggested remedies for NPSH and Cavitation.
- 11.45 **SESSION 3 – PUMP AND SYSTEM CHARACTERISTIC CURVES**
- Various types of system curves
 - Information required to plot system curve
 - The various types of pump curves for the various types of pumps
- 1.15 Lunch
- 2.15 **SESSION 4 – POWER, EFFICIENCY AND ELECTRICAL REQUIREMENTS**
- Power requirements
 - Motor selection, power consumption and energy savings, types of motors, torque and power factor
- 4.00 Refreshment
- 4.15 **SESSION 5 – VARIABLE SPEED SYSTEMS**
- Reasons for using variable speed systems
 - Energy savings under constant and fluctuating flow demand
- 5.00 Adjourned

DAY 2

- 09.00 **SESSION 6–AFFINITY LAWS**
The relationship between pump speed, flow, power, head and impeller diameter / Analysis of the pump composite performance curve.
- 10.00 Refreshment
- 10.15 **SESSION 7 – PUMP INSTALLATION, ALIGNMENT & FIELD TESTING METHODS**
- Rim and face alignment using the dial indicator and laser methods; alignment procedures and equipment set-up;
 - Determination of total head from gauge readings;
 - Flow measurements using volumetric methods, venture-meter, orifices pitot-tube and weirs.
- 11.30 **SESSION 8 – PUMP OPERATIONS AND MAINTENANCE ENGINEERING**
Pump performance and temperature monitoring, lubricant and pump analysis; Air entrainment, impeller clearance, installation, cleanliness, replacement and inspection of bearings.
- 1.00 Lunch
- 2.15 **SESSION 9- VIBRATION ANALYSIS**
Vibration level characteristics, vibration analysers, frequency, amplitude and phase.
- 3.15 **SESSION 10 – SAFETY AND PUMP PLANT RENOVATION**
Safety apparel and procedures / purpose of plant renovation, improvements, survey plan, implementation / summary of survey results and overall assessment.
- 4.30 Certificate of Attendance Presentation/ Refreshment/ End of Programme

THE FEE

RM 1,800.00 Per Participant
For group participants of (3), the Overall Discount is **RM 300.00**

"I/We would like to attend the 2-Day Short Course in "CENTRIFUGAL PUMPS – THEORY, DESIGN, OPERATIONS AND MAINTENANCE" dated 21 -22 May, 2008 at Shah Village Hotel, Petaling Jaya

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