



# UNDERSTANDING PUMPS: A SYSTEMATIC APPROACH

**SCEM 14 PDUs & PE-PDUs TO BE AWARDED . APPLICABLE FOR  
PRODUCTIVITY AND INNOVATION CREDIT (PIC)**

**Date** : 2 – 3 November 2016

**Time** : 9:00am – 5:00pm

**Venue** City Serviced Offices Pte Ltd  
No. 9 Raffles Place Level 18  
Republic Plaza II,  
Trademark Meeting Room  
Singapore 048619

## INTRODUCTION

Pumps take up 20 to 30% in a typical split of energy usage of motor driven equipment for an industrial plant. Commercial buildings, with lower demand for processes, it is between 15 to 20%. The large amounts of energy used for pumping makes pump systems a major candidate for energy savings. Pumping systems is usually less complicated when compared to process or chiller side optimization.

## COURSE OBJECTIVES

At the end of the course, participants will be able to:

- Understand the performance characteristic of pumping systems
- Gain an enhanced understanding of a systems versus component approach to optimize the energy efficiency of pumping systems
- Identify performance problems and systems that are most likely to yield energy efficiency savings
- Develop an action plan to achieve energy efficiency improvements
- Integrate continuous energy improvement into the management of pumping systems

## TARGET AUDIENCE

Engineers, Energy Managers and Facility Managers in the Process, Electronics, Pharmaceuticals, Engineering, Food Manufacturing, Oil and Gas Sectors.

Organized by:



## Programme Outline

### Day 1

- Pump system efficiency improvement using pre-screening and LCC approach
- Understanding Pump Systems & Process Demands
- Typical Pump Types in Industries
- Pump System Fluid Relationships
  - Fundamentals Hydraulics
  - Total Head
  - System Curves
- Understanding Pump Performance Characteristics
- Understanding Pump System Energy Use
- Introduction to PSAT

### Day 2

- Sample PSAT exercise
- Assessment introduction
  - Organising the assessment
  - Conducting the assessment
- How to collect field data collection
- Sample problem – group exercise
- Selecting a pump system optimization provider



## About SEAS

The Sustainable Energy Association of Singapore (SEAS), an industry association launched in 2006, today has 160 members in the area of Energy Efficiency, Solar, Wind, Biomass, Carbon and Clean Energy Financing. SEAS aims to be the voice of sustainable energy industry and promote the business of its member companies.

SEAS also specialises in training, courses and conferences focussed on sustainable energy. SEAS aims to be the one-stop information and training provider in the area of sustainable energy. Our trainers and lecturers are not only highly qualified academic professionals but also industry specialists and professionals that are successful and sought after practitioners in the area of Sustainable Energy. The majority of Key Qualified Personnel (KQP) and Accredited Energy Services Companies are members of SEAS. They have, as a group successfully executed a multitude of energy projects with varying complexities both locally and regionally.

## About the Trainer

**Ir. Kumarason S. Kandiah (Resource Consultant, ISI Ventures Sdn Bhd, UNIDO's International Trainer)** With more than 12 years working experience in system optimization of chiller, pumps and compressed air systems, Ir. Kumarason S. Kandiah has vast experience in conducting Investment Grade Energy Audits (IGAs), energy efficiency retrofits of chiller plants and feasibility studies at national and international level.

Kumarason has been involved in designed and retrofitting ACMV pumps, fans & compressed air systems for commercial & industrial applications. He co-developed a building monitoring system specifically inclined towards improving chiller efficiency that has been operating for more than 10 yrs at mission critical sites.

He was an expert consultant for MIGHT (Malaysian Industry-Govt Group for High Technology) on viable green energy businesses which will be used as a roadmap for Malaysia's green initiatives towards 2030. His Masters' degree was titled "Co-generation Potential in Selected Malaysian Industries" where the design & economic viability of co-generation systems for food & chemical industries was conducted.

### Registration Form – Understanding Pumps: A Systematic Approach 2-3 Nov'16

- Yes! I would like to register for this programme.  
 I am unable to attend but please put me on your mailing list.

Please indicate if you are our SEAS Member	Early Bird (Registration with payment made on/before 10 Oct 2016)	Normal Fee	Group Fee
<input type="checkbox"/> SEAS Member	S\$850.00	S\$950.00	-
<input type="checkbox"/> Non Member	S\$950.00	S\$1,200.00	S\$850.00

\* Fees are inclusive of GST.

\* Fees include refreshments, lunch and programme collateral.

\* Enjoy group discount **for 4 or more delegates** registered at the same time from the same organization and same billing source.

\* Only one type of discount scheme is applicable at any one time.

\* Please print and complete additional sheets where necessary.

\* Important: Walk-in delegates will only be admitted on the basis of space availability and with full payment made on site.

### Participant's Details

1. Name (\*Dr/Mr/Mrs/Ms): \_\_\_\_\_ NRIC: \_\_\_\_\_  
Designation: \_\_\_\_\_ HP No: \_\_\_\_\_  
Email: \_\_\_\_\_ SCEM No: \_\_\_\_\_ PE No: \_\_\_\_\_
2. Name (\*Dr/Mr/Mrs/Ms): \_\_\_\_\_ NRIC: \_\_\_\_\_  
Designation: \_\_\_\_\_ HP No: \_\_\_\_\_  
Email: \_\_\_\_\_ SCEM No: \_\_\_\_\_ PE No: \_\_\_\_\_
3. Name (\*Dr/Mr/Mrs/Ms): \_\_\_\_\_ NRIC: \_\_\_\_\_  
Designation: \_\_\_\_\_ HP No: \_\_\_\_\_  
Email: \_\_\_\_\_ SCEM No: \_\_\_\_\_ PE No: \_\_\_\_\_

### Organization's Details (For Billing)

- Company Name  Personal: \_\_\_\_\_  
Billing Address: \_\_\_\_\_  
Postal: \_\_\_\_\_  
Contact Person's Name (\*Dr/Mr/Mrs/Ms): \_\_\_\_\_  
Tel: \_\_\_\_\_ Fax: \_\_\_\_\_  
Email: \_\_\_\_\_

### Administrative Information

#### Registration and Payment

Please complete the enclosed registration form and forward it together with your **cheque at least 7 days before the commencement of the programme to**

**Sustainable Energy  
Association of Singapore  
No. 1 Cleantech Loop #02-06  
Cleantech One, Singapore 637141**

Crossed cheque should be made payable to  
**"Sustainable Energy  
Association of Singapore"**

#### Cancellation

SEAS reserves the right to change programme venue, cancel or reschedule the programme if necessary or warranted by circumstances beyond our control.

There will be no refund of fees for withdrawal. However, if the registration participant is unable to attend, a representative may be allowed to attend at no extra cost. Please inform us of the changes by fax or via email 3 days before the commencement of the programme.

#### Confirmation of Registration

Confirmation of registration will be given 5 working days before the commencement date via email. Registration is confirmed only upon receipt of payment.

If you do not hear from us

**Please contact Ms. Agnes Seah at:  
Tel: 63388578**

**Email: training@seas.org.sg**