Master Class on Process Industry Energy Audit

Get 60% Cash Payout From PIC Scheme

Date : 30 June; 1 – 2 July 2015

Time : 8:30am – 6:00pm

Venue : SEAS Training Centre
9 Penang Road #08-02 Park Mall
Singapore 238459

With the advent of the Energy Conservation Act, energy intensive Process Industries (Refineries, Petrochemical Plants, Specialty Chemicals and Food Processing) will have to submit annual Energy Efficiency improvement plans to the NEA. To be able to do that, Energy Audits need to be carried out annually to identify potential improvement areas.

The resources to carry out such Energy Audits Consultants. Even if the work were to be outsourced, it is advantageous for in-house Technical staff to be conversant with the techniques and knowledge required to carry out an Energy Audit. In addition to being in a better position to assess and select the external Energy Auditor, there will be better interaction during the Energy Audit on results and findings.

Energy Auditing is discipline that involves specific methodologies to first establish current energy flows of the equipment or system being audited and then to investigate if energy performance can be improved by corrective maintenance, operational adjustments or plant retrofit. It demands a good understanding of the operating principles of the equipment or system and the characteristics that cause good or bad energy performance. Knowledge of operating envelopes and constraints is also required to ensure feasible solutions are proposed. Quantification of baseline and improvement measures often can only be done with simulation models. The auditor should be conversant with latest relevant and applicable technology.

As there are so many varied processes, equipment and systems. Energy Auditing in the Process Industry is therefore a demanding discipline in terms of the knowledge that is required as described. Another facet that determines whether a facility is operated in an Energy Efficient way is whether it has good Energy Management System that ensures systematic measurement and control.

The masterclass is intended to give an overview of the above.

Programme Outline

Energy Auditing – what is it all about?

- Energy Audit Methodology (1 hour)
- Audit Measurement and Validation (1 hour)
- Analysing Tools and Methods (1 hour)

A general discussion of energy auditing methodology is first presented. This involves establishing the baseline performance of the equipment or a section of plant that is being investigated. This quantification enables an assessment if equipment degradation or poor operation has eroded energy efficiency, in which case, improvement measures can already be in the form of corrective maintenance or appropriate operational adjustments. Further improvements by retrofits can then be explored against this baseline. A review of the latest ISO 50002 Energy Auditing Standard against the points discussed in this section will be carried out to demonstrate the given methodology is in line with latest international standards.

Organized by:

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ENERGY EFFICIENCY NATIONAL PARTNERSHIP

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Common Equipment and Energy Performance

This is followed by presentations on typical equipment, unit operations and utility systems that are in the process industry. The basic operating principles and energy performance of the following common equipment will be discussed in addition to how their energy performance will affect the overall plant energy efficiency. Hands-on exercises will be provided with preconfigured spreadsheets for participants to observe effects of operation and maintenance on equipment performance.

For some of the equipment demonstrations will be carried out with simulation models. Actual case studies from Energy Audits will be discussed to illustrate key learning points.

- Centrifugal Pumps and Reciprocating Pumps (2 hours)
- Fans / Blowers / Root Compressors (1/2 hour)
- Centrifugal Compressor and Positive Displacement Compressor (1 hour)
- Steam Turbines (1 hour)
- Liquid Ring Pump and Ejectors (1/2 hour)
- Chillers and Cooling Towers (1 hour)
- Motors, Transformers and Power Factors (1/2 hour)
- Steam Distribution System (1/2 hour)
- Boiler / Heaters (1 hour)
- Distillation Columns (2 hours)
- Heat Exchangers (1 hour)

Process Systems Energy Efficiency Performance

The above section deals with individual process equipment and their related energy efficiency aspects. How such equipment are operated as a system can also make a difference to overall plant energy efficiency. It is therefore essential to also perform comprehensive analysis of the system as a whole. This following section gives an overview of energy efficiency improvement possibilities of process systems.

- Co-Generation and captive power generation Concepts (1 hour)
- Low Temperature heat recovery (1 hour)
- Heat Exchanger Network and Pinch Technology (1 hour)
- Variable Speed Drives (1/2 hour)
- Utility Optimization (1/2 hour)

Hands on exercises will be provided with preconfigured spreadsheets for participants to observe effects of efficiency improvements with properly configured and heat integrated process systems. Actual case studies from Energy Audits will be discussed to illustrate key learning points.

ISO 50001 Energy Management System (2 hours)

The final section of the masterclass will be to help the participant determine if his own workplace is compliant to ISO50001 Energy Management System standard. Ultimately for any workplace to be a top performer in Energy Efficiency, it should have the proper management processes in place and ISO50001 provides a comprehensive checklist. This module provides a familiarization of the elements of ISO50001 and in particular details and examples will be given of

- Energy Baselines
- Energy Performance Indicators
- Operational Parameters and how they affect Energy Performance Indicators
- Online Energy Dashboards to steer Operational Adjustments and timely planning of corrective maintenance.

Energy Survey at each Participant's Plant Facilities (1 day)

In order to help consolidate the learning from this Master Class, an onsite 1 day Energy Survey will be conducted by an Actsys consultant together with the respective participant(s) from each Plant, to work on an area of the participant's choosing to identify and quantify potential improvement. This exercise will provide an opportunity for the participant to put into practice newly acquired knowledge and to have a 1-1 coaching by the Actsys consultant.

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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

Norman Lee is the Managing Director and Founder of ACTSYS (for more information, please visit http://www.actsys.com), providing consultancy services for performance monitoring and energy optimization of power plants, refineries, and petrochemical complexes.

With more than 30 years of industrial experience in British Petroleum and Shell, Norman is a leading consultant in thermal conversion, distillation, gas treating and utilities, providing plant performance monitoring and technological services for refinery projects, plant modification and optimization.

Norman graduated from Imperial College, University of London in 1979 with a first class honours degree in Chemical Engineering. He also completed his M.Sc Advanced Chemical Engineering degree from the same university. He is a Fellow of the Institution of Chemical Engineers (UK) and a Singapore Certified Energy Manager

Liu Shanshan is a consultant of ACTSYS with extensive experience in handling local and regional projects with combined cycle and cogeneration based power plants. She has performed power plant feasibility studies, power plant performance monitoring, rott cause analysis in power plants, energy audit, trouble shooting projects and performance assessment projects.

Shanshan graduated with BSc Chemical Engineering degree from the University of Alberta Canada in 2007. She worked in Suncor Energy Oil Sands project in Alberta before joining ACTSYS in 2008.

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Registration Form

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

	Early Bird (Registration with payment made on/before 29 May 2015)	Normal Fee (Closing Date: 23 June 2015)	Group Fee (Closing date: 23 June 2015)	No. of Delegates	Fee Payable
☐ SEAS Member	S$1,968.80	S$2,461.00	-		
☐ Non Member	S$2,461.00	S$2,953.20	S$2,354.00		

* 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: _____
2. Name *(*Dr/Mr/Mrs/Ms):* _____ NRIC: _____
   Designation: _____ HP No: _____ Email: _____
3. Name *(*Dr/Mr/Mrs/Ms):* _____ NRIC: _____
   Designation: _____ HP No: _____ Email: _____

Organization's Details

Company Name: _____

Company 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
9 Penang Road
#08-02 Park Mall
Singapore 238459

Crossed cheque should be made payable to **"Sustainable Energy Association of Singapore"**
Application will close on **23 June 2015**

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: 63379886
Email: training@seas.org.sg
Fax your registration form to 63376658