15 - 17 FEB 2017 | 9:00AM TO 5:00PM | WWW.SEAS.ORG.SG

STEAM & COMPRESSED AIR SYSTEMS

(A MODULE UNDER THE SCEM-PROFESSIONAL LEVEL)
**EXAM OPTIONAL FOR NON-SCEM CANDIDATES

COURSE OVERVIEW

Compressed air and system systems consume significant energy in industrial plants. In addition, there are many opportunities to recover waste heat from various industrial processes. Therefore, energy efficient design and appropriate operation strategies for the above systems have the potential to significantly reduce energy consumption in industrial facilities.

Participants will gain a good fundamental understanding of compressed air and steam processes and be able to identify opportunities for recovery of waste heat.

COURSE OBJECTIVES

- Understand the functions and components of compressed air and steam systems
- Analyse energy performance characteristics and identify potential energy saving opportunities in compressed air and steam systems
- Select heat recovery devices and analyse heat transfer performance
- Operate the above systems in an energy efficient manner

PDUs TO BE AWARDED TO SCEMs AND PROFESSIONAL ENGINEERS

APPLICABLE FOR PRODUCTIVITY AND INNOVATION CREDIT (PIC)

SEAS
Sustainable Energy Association of Singapore

15 - 17 FEBRUARY 2017
9:00AM - 5:00PM

Republic Plaza II, Trademark Meeting Room
9 Raffles Place Level 18, Singapore 048616

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PROGRAMME OUTLINE

Day 1:

Steam Systems - general introduction

- Steam generation processes, Types of steam, Properties of steam, Steam tables, Calculation of steam properties, Practice problems

Boilers

- Introduction to boilers, Basic boiler operation, Fuels, Boiler blow down & draught, Air fuel ratio, effect of excess air, Combustion efficiency, Calculation of boiler overall efficiency, Quick estimation of boiler efficiency

Optimizing steam systems

- Steam pressure, Fuel switching, Boiler blow down, Auxiliary equipment, Heat recovery form flue gas, Condensate recovery, Steam leaks, Steam traps, Other measures, Assignment

Day 2:

Compressed air systems - general introduction

- Components of compressed air system, Definitions parameters such as standard pressure and temperature, standard flow rate, dew point, free air delivery, utilization factor, specific power, Types of compressors, Selection of compressors for different industries, Basic theory of compression

Design consideration

- Power consumption calculation, Comparison of specific power, Efficiency, Single stage, multi-stage, intercooling, Heat recovery potential, Different types of dryers, requirements, comparison of energy consumption

Energy saving measures

- Receiver sizing, System pressure losses, Compressed air leaks, quantification, Compressor intake temperature, Compressor controls strategies, Practice problems and assignment

Day 3:

Waste heat recovery system - general introduction

- What is waste heat, Benefits of waste heat recovery, Sources and use of waste heat, Calculation involving waste heat recovery, Parameters controlling waste heat recovery

Modes of heat transfer

- Conduction, Convection and Radiation, Heat transfer through composite materials and radial heat transfe

Heat exchangers

- Parallel flow, Counter flow, Cross flow, Performance of heat exchangers, Log mean temperature difference, Correction factors for corss flow heat exchangers, Shell and tube heat exchangers, Correction factors for shell and tube heat exchangers, Plate type heat exchangers, Extended surface, Fouling of heat exchangers, Overall heat transfer coefficient of heat exchangers, Typiical values of overall heat transfer coefficient

ABOUT THE TRAINERS

Dr. Lal Jayamaha is the author of the book "Energy Efficient Building Systems" published by McGraw-Hill, USA and the founder of LJ Energy Pte Ltd which is one of the leading ESCOs (Energy Service Companises) in Singapore.

In 1990, he was awarded a Research Scholarship by the National University of Singapore to undertake a research leading to a MEng degree. After completing his Masters degree in 1993 he continued his research in heat transfer relating to building heat gain and building energy perfromance and was awarded a PhD. degree in 1997. He is a KQP, LEED AP, Professional Engineer and a Chartered Engineer. He is also a member of the Institution of Mechanical Engineers, UK and the American Society for Heating, Refregerating and Air-conditioning Engineers.

Dr. Jahangeer K. Abdul Halim graduated with a Master of Science in Mechanical Engineering from National Unnivrsity of Singapore in 1998. He was awarded a Research Scholarship by the National University of Singapore (NUS) in 1999 to undertake a research project on solar energy and was awarded a Master of Engineering (M.Eng) degree in 2002. After completing his M.Eng. degree, he continued with research and teaching at NUS and his research on evaporatively-cooled condensers of air-conditioning systems led to the award of a PhD. degree in 2013. Dr. Jahangeer's areas of specialization include: evaporative cooling of air-conditioners, solar thermal systems, heat pump systems, building energy simulation and energy optimization.

RATES

NORMAL FEE	SCEM CANDIDATE FEE	GROUP FEE
S$963.00	S$674.10	S$580.00 (4+ delegates from 1 orginization)

*** Fees inclusive of GST**

*** Registration is confirmed only upon receipt of payment.**

*** SEAS reserves the right to to make changes to the trainer, programme, venue, cancel or reschedule programme if necessary or warranted by circumstances beyond our control**

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REGISTRATION FORM

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PARTICIPANT'S DETAILS	Number of Delegates	Fees Payable		
1	Name (Dr/Mr/Mrs/Ms)		NRIC No	Designation
	HP No	Email		PEB ☐ SCEM ☐
2	Name (Dr/Mr/Mrs/Ms)		NRIC No	Designation
	HP No	Email		PEB ☐ SCEM ☐

ORGANIZATION'S DETAILS

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