



Education Workshops Series - Fund Raiser

Chilled Water Systems and Cooling Tower

This workshop addresses chilled water systems, improving chiller efficiency, AC cost and efficiency considerations, and specific cooling tower efficiency, and explores the trade-off between cooling tower size and energy savings. Topics include typical systems that use cooling towers, key elements of cooling tower design, efficiency features, efficient operation, and maintenance issues.

Air Handling Systems Efficiency

This workshop provides an overview of air conditioning systems, integrated demand side management, and related energy code measures. Attendees will learn how to minimize the cost of large, commercial central air conditioning system while keeping the facility comfortable. Major topics include variable and constant air-volume systems, adjustable speed-drives, ventilation, economy cycle, and other efficiency opportunities. Examples will be presented that demonstrate a model for analyzing typical, variable air-volume retrofit economics.

Adjustable Speed Drives

This class will cover system fundamentals including load types, flow control for pumps and fans, and adjusting motor speed with ASDs. All techniques discussed will be practical and proven approaches. Some energy efficiency strategies we will cover include air conditioning for commercial facilities and load control for process facilities. This class also will explore potential application problems such as power quality issues.

Energy Management Systems

This class covers how to maximize savings using the most current technology in HVAC control methods, explores communication networks, equipment studies, conceptual system design, integrated demand side management, and cost/benefit analysis to help identify, design, and plan for energy management systems.

Designed Specifically for:

- Building management controls systems service technicians
- Building Operator Certification graduates (BOC)
- Chief engineers, engineering staff, building operators and maintenance
- General managers, property managers, directors, project managers, operation managers & staff
- HVAC engineering designers and specifiers
- HVAC repair and service technicians
 - UHWO Facility Management Degree students

Founded in 1980, IFMA is the world's largest and most widely recognized international association for facility management professionals, supporting 24,000 members in 105 countries.

Hawaii's chapter is proud to be one of the 134 chapters worldwide, manage more than 37 billion square feet of property and annually purchase more than US \$100 billion in products and services.

The proceeds from these trainings will allow IFMA Hawaii to support the development of the Facility Management profession in Hawai'i and the Degree Program at University of Hawaii at West Oahu

Workshop Schedule

May 2nd, 2016

8:00 am – 4:00 pm: *Chilled Water Systems and Cooling Tower*

Lunch program: Facility Management Degree Program by UH West Oahu

May 3rd, 2016

8:00 am – 11:30 pm: *Air Handling Systems Efficiency*

Lunch program: Sponsor presentations

12:30 pm – 4:00 pm: *Adjustable Speed Drives*

May 4th, 2016

8:00 am – 4:00 pm: *Energy Management Systems*

Lunch program: Panel Discussion – *Skills Future Facility Managers in Hawaii Must Have*

Location

Hawaiian Electric Company Training Room

932 Ward Ave – Entrance is on the street level

Honolulu, HI 96814

Parking is available at Neal Blasdel Center for \$6

Workshop Cost

\$335 per day

Discount Rates Available!

- Qualified participants **pay only \$200** per day with a Hawaii Energy subsidy.
- Exclusive - ASHRAE Hawaii members **pay only \$100** per day with ASHRAE and Hawaii Energy subsidy.

Registration

<http://www.ifma-hi.org/fm.html>

Deadline: April 25, 2016

Sponsors



Workshop Descriptions

Chilled Water Systems and Cooling Towers (7 hours)

Chilled water systems are used to provide air conditioning for commercial buildings and industrial facilities and to support industrial processes. This class presents an overview of chiller systems including basic components and operations, sizing air-conditioning loads, air-conditioning system concepts, common system configurations, measuring chiller efficiency, improving chiller efficiency, AC cost and efficiency considerations, compressors, condensers, cooling towers, and water treatment options. This class compares air-cooled and water-cooled chiller systems and discusses the pros and cons for each type of system.

- Identify and describe the major components of a chilled water system
- Discuss the main concepts of chiller system load control, including variable speed for chillers, pumps, and cooling tower fans
- Discuss efficient plant operations and how adjusting condenser water temperature affects efficiency
- Describe the differences between constant and variable chilled water flow
- Compare the benefits of central plant cooling versus package unit cooling
- Define the concept of IDSM and describe demand-side management strategies that can be used for chilled water and cooling tower systems

Air Handling Systems Efficiency (3.5 hours)

HVAC professionals will be given a foundation and overview of air conditioning systems, integrated demand side management, and related Title 24 measures. Attendees will learn how to minimize the cost of large, commercial central air conditioning system while keeping the facility comfortable. Major topics include variable and constant air-volume systems, adjustable speed-drives, ventilation, economy cycle, and other efficiency opportunities. Examples will be presented that demonstrate a model for analyzing typical, variable air-volume retrofit economics.

- Identify the components of a central plant system and explain how the chiller, cooling tower, boiler, air handling system, and pumps function to remove heat loads
- Identify the major components of an air handling system and describe how they function
- Describe how different fan characteristics affect the system's efficiency
- Compare the characteristics of constant air volume systems and variable air volume systems
- Assess the differences in control and efficiency for variable and constant air volume systems and how to optimize performance of each
- Discuss the basics of capacity control and compare flow control by dampers and variable speed drives and how they can enable energy and cost savings
- Describe a typical methodology for analyzing and assessing costs of different system options
- Define the concept of IDSM and describe demand-side management strategies that can be used for air handling systems

Adjustable Speed Drives (3.5 hours)

Adjustable speed drives (ASDs) are found in commercial, process, and industrial facilities. ASDs are used to modulate the speed of operations, which can save on energy costs. This class will cover system fundamentals including load types, flow control for pumps and fans, and adjusting motor speed with ASDs. All techniques discussed will be practical and proven approaches. Some energy efficiency strategies we will cover include air conditioning for commercial facilities and load control for process facilities. This class also will explore potential application problems such as power quality issues. Get smart about using ASDs with intelligent control to apply savings strategies.

- Define the types of adjustable speed loads
- List the types of adjustable speed drives including variable frequency drives (VFDs)
- Describe how ASDs function in typical facility systems
- Assess what type of control is best for different AFD applications
- Identify instances where ASDs can help save energy
- Compare the economic benefits and tradeoffs of using ASDs
- Explain how ASDs impact motors and systems
- List methods to overcome ASD power quality and motor insulation issues

Energy Management Systems (EMS) (7 hours)

This seminar is for management, operations, and maintenance professionals with a basic understanding of HVAC systems. Learn about the potential operating cost-savings using Energy Management Systems, and how to maximize savings using the most current technology in HVAC control methods. Attendees will explore communication networks, equipment studies, conceptual system design, integrated demand side management, and cost/benefit analysis to help identify, design, and plan for your Energy Management Systems.

- Identify the different features and configurations of basic HVAC systems
- Describe the three levels of facility controls and ways to control a local loop
- Assess system control strategies for energy conservation
- Describe EMS functions, controls, and techniques for air systems, package units, central refrigeration equipment, hot water boiler plants, and lighting systems equipment
- Explain how EMS network components integrate with control network technology
- Assess the pros and cons of network architectures alternatives
- Discuss the benefits of interoperability
- Define the concept of IDSM and describe demand-side management strategies that can be used for energy management systems
- Identify relevant Hawaii Energy programs that can help save energy and reduce costs maintenance functions comprise the majority of the operations that must be managed on a day-to-day basis. By providing best practices in O&M service, you can increase customer satisfaction and enhance the value of the facility and the facility department.

Instructor

David Wylie (the "W" of ASWB Engineering, formerly ASW) has a wide range of energy engineering experience, including research, development, program design, measurement, feasibility study of electrical and mechanical systems, and energy supply for commercial and industrial facilities. David, who holds a college teaching credential, teaches what he does and knows about, and has developed over 20 courses that address energy efficient systems. He has an ability to take sophisticated engineering concepts and relate them in a way you can understand, and the materials are presented in a friendly and practical way. Several of David's articles have been published in trade magazines, and he has written a book titled "New Refrigerants for Air Conditioning and Refrigeration Systems." ASWB Engineering has received awards for innovations in engineering from the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE), Southern California Edison, and California's governor. David has been coming to Hawaii over the past 20 years working on various engineering projects, energy audits and holding energy related trainings.