

ENERGY EFFICIENCY OF CHILLED WATER SYSTEMS AND COOLING TOWERS

Chilled Water – November 12, 2015

Cooling Towers – November 13, 2015

7:30 am until 4:30 pm

**Puget Sound Energy
Summit Conference Room
10885 N.E. 4th Street
Bellevue, WA 98004**

Single Day Registration Fee: \$139

Two Day Registration Fee: \$199

.7 Continuing Education Units through Washington State University for each day may be made available for this training (1.4 units for both days)

Key Learning Objectives–Chilled Water

- Understand various chiller machinery types, advantages and disadvantages
- Investigate methods of chiller efficiency improvements
- Consider variable chilled water flow

Key Learning Objectives–Cooling Tower

- Evaluate cooling tower efficiency and cost impact
- Assess tower sizing
- Analyzing performance

Who Should Attend

- Operational staff and maintenance engineers
- Managers and executives
- System/process engineers
- Efficiency organizations and utility staff

Agenda

November 12: Chilled Water Systems

7:30 Registration (breakfast provided)

8:00 Morning Session

- Introduction to chilled water systems
- Measuring chiller efficiency
- What improves chiller efficiency
- Using variable speed on the compressor
- Refrigerant options and issues

11:30 Lunch (provided)

12:30 Afternoon Session

- Cost of high efficiency
- Engine driven and absorption chillers

2:00 Break

2:15 Afternoon Session Continued

- Variable chilled water flow
- Chiller replacement cost analysis example

4:15 Summary and Evaluation

4:30 Adjourn

November 13: Cooling Towers

7:30 Introduction (breakfast provided)

8:00 Morning Session

- Cooling tower principles
- Brief physics lesson
- Design alternatives and construction types

11:30 Lunch (provided)

12:30 Afternoon Session

- Tower sizing
- Performance factors
- Sizing and cost class exercise

2:00 Break

2:15 Afternoon Session Continued

- Capacity control
- Water consumption
- Water treatment traditional and alternatives

4:15 Summary and Evaluation

4:30 Adjourn

Course Descriptions: **Chilled Water Systems**, which provide cooling for industrial and commercial facilities, often account for a major portion of the energy consumed in these facilities. Attendees will learn how technology improvements can reduce energy costs by more than half. Topics include chiller machinery, refrigerant options, the impact of using variable speed for compressors, and system pumps. In addition, a case study will be presented that shows how an energy-efficient chiller was selected. The **Cooling Tower** course addresses efficiency measures and other issues, including cooling tower sizing vs. energy savings, approach control strategies (efficient fan operation), water treatment (including ozone), water conservation and maintenance. This course includes a case study exercise that works through an example of how a cost-effective and efficient cooling tower was selected.

Instructor: **David M. Wylie, P.E.** David has an engineering degree from Cal Poly San Luis Obispo and a MBA at National University. Since the early 1970s, David has been analyzing energy efficiency investment from both a mechanical and financial perspective. David and his two partners began working together in 1976 and the engineering management consulting firm of ASWB Engineering. Their work experience covers the range of energy engineering including research, development, program design, measurement, feasibility study of electrical/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.

Hosting Sponsor



Co-Sponsoring Organizations



This training is provided by ASWB Engineering. For more information: <http://www.aswb-engineering.com/>

The Northwest Regional Industrial Training project is coordinated and funded by the Northwest Energy Efficiency Alliance (NEEA), a private non-profit organization funded by Northwest utilities, the Energy Trust of Oregon, and Bonneville Power Administration. NEEA and its stakeholders subsidize up to 85% of the cost to attendees, which means the cost listed on the front of this brochure is significantly less than the average price in the marketplace. NEEA works in collaboration with its stakeholders and strategic market partners to accelerate the sustained market adoption of energy-efficient products, technologies, and practices. NEEA's market transformation efforts address energy efficiency in homes, businesses, and industry.

How to Register

Registration deadline is October 29, 2015

To register online for Chilled Water on 11/12 - \$139:
www.regonline.com/155neea-industrialtraining

To register online for Cooling Towers on 11/13 - \$139:
www.regonline.com/156neea-industrialtraining

To register online for Chilled Water & Cooling Towers on 11/12 & 11/13 - \$199:
www.regonline.com/157neea-industrialtraining

Or phone, fax, email, mail the registration form below to:

Phone: 888-720-6823
Fax: 503-525-4800
Email: industrial-training@industrial.neea.org

NEEA Industrial Training c/o Ecova
100 SW Market St, #200
Portland, OR 97201

Please make checks payable to NEEA Industrial Training
c/o Ecova#2300

Questions

Visit <http://neea.org/get-involved/calendar> or contact the training center at 888.720.6823 or industrial-training@industrial.neea.org

Registration Form - Please register me for:

- ☐ Chilled Water on November 12: \$139
☐ Cooling Towers on November 13: \$139
☐ Chilled Water & Cooling Towers on Nov 12-13: \$199

First Name	Last Name	Title	Phone/Fax
Company Name			E-mail Address
Electric Utility Provider			
Address			Please indicate special diet needs ☐ Vegetarian ☐ Other _____
City	State	Zip	
Participation approved by: Supervisor name _____			E-mail _____

Payment Options

Please enclose a check with this registration form and mail to the above address.

If paying by purchase order please call 888-720-6823 or fax registration form to 503-525-4800.

Discount Code: _____ Purchase Order: _____

Cancellation Policy: Full refund of registration fee if attendance is cancelled by October 29; half refund thereafter.