

Free Educational Seminar

For PGE Commercial and Industrial Customers

Industrial Pump Systems

This free half-day seminar provides an understanding of motors, pumps and variable-speed drives that can reduce energy use and improve process control in systems with varying loads.

This seminar will equip participants to better:

- *Define terms related to pump systems*
 - *Explain what a pump is and how it works*
 - *Discuss what a pump system includes*
 - *Discuss why it is important to improve pump system performance*
 - *Review the various types of pump systems and pumps*
 - *Identify opportunities for pump system improvement*
 - *Explain what measurements will need to be taken*
 - *Discuss potential options to improve pump system performance*
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Who should attend?

Decision makers who want to improve their knowledge of electric motor drive systems, pumps, and drives:

- *Business owners and leasing agents*
 - *Plant, process, and energy engineers*
 - *Facility managers*
 - *Operational Managers*
 - *Electrical and mechanical engineers*
 - *Maintenance technicians*
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Instructor

Ronald G. Wroblewski, P.E., Productive Energy Solutions, LLC

Ron has over 25 years of engineering experience helping customers design, analyze, specify and optimize commercial and industrial energy systems. In addition to earning both a bachelors and masters degree in mechanical engineering, Ron is a highly rated trainer who applies proven principles of adult education to make his technical seminars beneficial and fun. He is the senior DOE fan systems trainer, and provides industrial energy efficiency training worldwide for the United Nations.

Time and Location

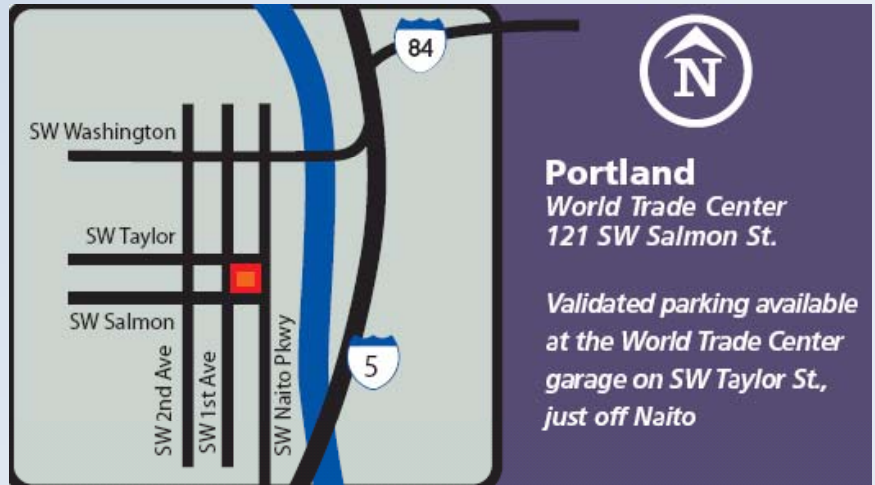
Thurs. Nov., 19, 2009

7:30 a.m.– 12:00 p.m.

2 World Trade Center

Continental Breakfast: 7:30 a.m.

Seminar: 7:50 a.m.



Cost

Free to PGE customers. Others are welcome based on availability of space, small fee may apply.

Accreditation

- **Clackamas Community College:** 0.4 CEU's (continuing education units)
- Certificate of Completion that can be used towards the BOMA Certification

Registration

RSVP is requested as soon as possible. However, we can accommodate a few walk-in registrations. To register, e-mail PGE.Seminars@pgn.com or call **503-464-8020** and press "1" for classes.

More educational opportunities

For more information on additional classes for PGE business customers, visit our Web site at PortlandGeneral.com/Classes. Classes may be added throughout the year. If you'd like to receive e-mail notices of new class offerings, e-mail PGE.Seminars@pgn.com.

Additional classes to look forward to in 2009/2010:

- Basics of Electricity
- Compressed Air Systems
- Chilled Water Systems
- Energy Champions Workshop
- Industrial Fan Systems
- Lighting Retrofits
- Monitoring Load Shape for Energy Savings
- New Trends in Lighting



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