

## Geothermal Heat Pump System Design Seminar

Thursday, June 4, 2015

Manitoba Hydro Place, 360 Portage Avenue, 3rd Floor, Winnipeg

### Who Should Attend

Mechanical Engineers, HVAC Design Professionals, Heat Pump Contractors, Design/Build Contractors, Facility Engineers, Utility Personnel, Architects, Commissioning Agents and Drilling Contractors.

### Course Highlights

This seminar will highlight characteristics of successful system installations while discussing potential reasons for less successful systems and those with higher than necessary costs. The closed-loop system chapters of the new ASHRAE text, *Geothermal Heating and Cooling: Design of Ground Source Heat Pumps* will be covered in this workshop and include:

- Equipment for Ground Source Applications
- Fundamentals of Vertical Ground Heat Exchanger Design
- Applied Ground Coupled Heat Pump System Design
- Surface Water Heat Pumps
- Piping and Pumps for Closed-Loop Ground Source Heat Pumps
- GSHP Performance and Installation Cost

### Reference Material

Attendees will receive course handouts and instructors' materials, as well as the new revised ASHRAE reference manual: *Geothermal Heating and Cooling: Design of Ground-Source Heat Pumps*, by Kavanaugh & Rafferty 2014.

### About the Instructor

**Steve Kavanaugh, PhD, Fellow ASHRAE, Fellow ASME**

Kavanaugh served as a professor of mechanical engineering at the University of Alabama from 1984 to 2007 and is now Professor Emeritus. He was the owner of Energy Information Services from 1993 to 2012 and currently maintains the website [www.geokiss.com](http://www.geokiss.com), a resource of HVAC and GSHP information and design tools.

Kavanaugh is the author of the ASHRAE publication *HVAC Simplified* (2006) as well as numerous other articles, and has presented more than 140 GSHP and HVAC seminars to more than 4500 attendees on the topics of ground-source heat pumps, energy efficiency, and HVAC. These include ASHRAE professional development seminars (PDSs), short courses, and several local chapter-sponsored sessions. In 2001, he was the recipient of ASHRAE's Crosby Field Award for the highest-rated paper presented at an ASHRAE Technical Session, Symposium, or Poster Session for the year.

Kavanaugh is the Handbook Subcommittee chair of ASHRAE Technical Committee (TC) 6.8, Geothermal Energy, and has served as chair of both TC 6.8 and the now merged TC 9.4, Applied Heat Pumps and Heat Recovery. He was also an ASHRAE Scholarship Trustee in 2013–14. He served as the chair of the Board of Directors of Habitat for Humanity of Tuscaloosa from 2001–2003 and 2010–2011, and he was the construction supervisor for five homes of Habitat for Humanity of Tuscaloosa.



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# POWER SMART FOR BUSINESS

## Geothermal Heat Pump System Design Seminar

Thursday, June 4, 2015

8:00 am to 4:00 pm

Manitoba Hydro Place, 360 Portage Avenue, 3rd Floor, Winnipeg

**Limited Space Available - Book Early!**

### Registration Information

**Cost: \$299.<sup>00</sup> plus \$14.<sup>95</sup> GST (Total \$313.<sup>95</sup>)**

Includes breaks, lunch and course material, including the new ASHRAE reference manual.

NAME: \_\_\_\_\_

TITLE: \_\_\_\_\_

ORGANIZATION: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

CITY/TOWN: \_\_\_\_\_

POSTAL CODE: \_\_\_\_\_

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_

EMAIL: \_\_\_\_\_

### Send completed forms to:

Email: [earthpowerinfo@hydro.mb.ca](mailto:earthpowerinfo@hydro.mb.ca)

Fax: (204) 360-6157

Mail: Manitoba Hydro, Earth Power Program  
Attn: John Heminger  
360 Portage Avenue, 7th Floor  
Winnipeg, MB R3C 0G8

### Payment Information

**Cost: \$299.<sup>00</sup> plus \$14.<sup>95</sup> GST (Total \$313.<sup>95</sup>)**

☐ **Cheque attached**

(Make payable to: Manitoba Hydro)

☐ **Invoice Organization**

Please ensure all contact information provided is accurate for invoicing purposes

GST #122063779

The personal information in this form is being collected to register participants in the above seminar and for invoicing, record-keeping and evaluation purposes. Other uses and disclosures may be to the Public Utilities Board for statistical reporting, external auditors as part of a sample audit, government entities for reporting purposes and Manitoba Hydro officials on a need to know basis. It is protected by the Protection of Privacy provisions of *The Freedom of Information and Protection of Privacy Act*. If you have any questions about the collection of this information, contact Manitoba Hydro, 360 Portage Avenue, Winnipeg, Manitoba R3C 0G8 or by telephone at (204) 360-4018.

**For more information:** Contact Lindsay Maitland at [earthpowerinfo@hydro.mb.ca](mailto:earthpowerinfo@hydro.mb.ca) or (204) 360-4018

**Registration cutoff: May 22, 2015**

Manitoba Hydro reserves the right to cancel any course up to one week preceding the scheduled course date.



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