



IGSHPA Training News

by Peter Tavino, P.E., CGD

About 20 IGSHPA (International Ground Source Heat Pump Association) trainers gathered in Stillwater, Oklahoma, in February to hear Dr. Charles Remund present program updates for future training and testing of installers. The two-day "epic powwow" featured new educational slides for accredited geoechange installer candidates. Accredited mechanical installers instruction is still being developed, in recognition of the differences between these two work tasks.

Dr. Jim Bose launched the meeting. Hundreds of excellent ground source informational slides were shown. While IGSHPA will formally release policy and implementation procedures, some important topics of discussion, from my perspective alone, are previewed here.

The new slides express the themes within the Dr. Remund authored *Design and Installation Guide*. Future three-day workshops will give modern training, with more photographic images, charts, software, Web site links, and references.

It was great to reacquaint with fellow trainers. We were all asked to submit sample exam questions for new multiple choice testing by NATE (North American Technician Excellence). From a larger pool of hundreds, will come the final testing. Past test survey comments sent to NATE by candidates these past 18 months will be reviewed to enhance the future exam experience. The 90% open book passing grade will remain or possibly be lowered.

Questions to Dr. Remund and discussions about current issues are relevant to each of us. It was reported some geothermal systems were being dug up to verify proper installation, and in one case, paper bags were found 20 feet deep in boreholes from an improper grouting scenario. The idea to use a cut tennis (or golf) ball over 1¼-inch HDPE (high-density polyethylene) to snake around tight building penetration sleeves, might have application in a new aerodynamic boot fitting over tremie pipe ends. This can assist in pushing the tremie to the bottom of the bore, and then blowing it off once grout starts flowing. Or alternatively, tremie pipe ends can be curve

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chamfered, more like U bends. We discussed link seals, confirming the proper water temperature, quality, and volume in grout, and how bentonite grout hydrates differently than cement grout. Six-inch steel casing should not be annularly ungrouted in an 8-inch bore. It was reported as the late summer peak cooling month arrives, rain-deprived fluctuating groundwater levels can change saturated, moist ground to dry, greatly reducing the anticipated thermal conductivity. Dr. Remund described the graphite grouts used for horizontal bores.

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Soil thermal diffusivity factors to increase horizontal loop lengths, but not vertical loops, were reported to be incorporated into borehole length/spacing formulae already. Diffusivity is not a factor for residential applications, but does appear on the worksheet. The average heat of earth extraction multiplier of 500 was seen to be about 8.3 pounds per gallon of water weight times 60 minutes per hour.

Thus, a three-ton entering 40°F (4.4°C) water leaving at 34°F (1.1°C) will deliver 6°F (-14.4°C) x 9 gallons per minute x 500 = 27,000 British thermal units per hour or 2.25 tons of true ground source heating into a building. The new PowerPoint slide lesson *Start Up and Performance Checking & Troubleshooting* describes the proper instruments to be used to measure this efficiency.

Areas for future discussion could include heat fusion certification cards, whether vertical loop installers will be NATE tested, NATE retesting for Energy Star Quality Installers, the latest training committee activity, and ethics standards for job referrals, etc.

Trainers signed legal agreements with IGSHPA, and left the new headquarters offices better prepared to communicate with the ground source energy installers of tomorrow.

Next month we will discuss retrofits.

The statements and comments in this article are my own and are based on information and references believed to be true and factual. If you have any questions or comments, please forward them to me care of WWGR.

Peter

Peter Tavino may be contacted via e-mail at
admin@worldwidegeothermalresource.com

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