The SOURCE
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Hello and Good-bye

By Robert Jones

The 1999 GeoExchange Conference and Expo saw a number of new faces and was also a time to say good-bye to a longtime supporter of the GeoExchange industry.

Name badges with VIP ribbons were everywhere, a testimony to the number of conference attendees who had never been to an IGSHPA-sponsored event. Representatives from California, across the fruited plain, and other countries came to learn and to share their knowledge with other professionals in the field. Judging by the lively question-and-answer sessions following many of the presentations, GeoExchange technology continues to interest professionals in fields ranging from HVAC installers to water utilities, from housing developers to geologists. Approximately 205 participants and exhibitors attended the conference, including 107 new faces.

(continued on pg. 3)

Sacramento, California was the site of the 1999 GeoExchange Industry Conference and Expo.

Inside...

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Bulletin Board

Advisory Council Election

The IGSHPA Advisory Council had four positions to fill this time around. The following council members were re-elected:

Billy Abner

Marketing Account Manager
East Kentucky Power Cooperative

Mr. Abner has 26 years of experience in the electric utility industry. He has been involved in the marketing and installation of geothermal heat pumps since 1987. Mr. Abner has a BS degree in Industrial Technology and is also a licensed Master and Journeyman HVAC contractor. He serves on several national, state, and local committees and boards.

Bill Dean

Vice President of Operations and Engineering
WaterFurnace International, Inc.

Mr. Dean joined WaterFurnace International as Director of Marketing in 1996, and was soon promoted to Director of Product Management. He recently became VP of Operations and Engineering and is responsible for overseeing engineering, product management, manufacturing, quality, materials, and MIS operations. He has a BS in Mechanical Engineering and an MBA. In addition to serving on the IGSHPA Advisory Council, Mr. Dean is also a member of ASHRAE and ARI.

Scott Jones

Sales Manager
ECONAR Energy Systems Corporation

Mr. Jones has been active in the development of geothermal heat pumps since 1982 and has been active in growing the market in northern climates. As an IGSHPA certified trainer, he has trained, tested, and accredited over 300 students. He is a member of IGSHPA and other heat pump associations.

The IGSHPA Advisory Council also welcomes one new member:

Chuck Perry

Geothermal and WSHP Product Manager
Carrier Corporation

Mr. Perry is an IGSHPA-certified installer. He has 20 years of experience in the HVAC industry, including 10 years as a contractor, 8 years as a distributor, and 3 years in HVAC manufacturing.

The IGSHPA Advisory Council Elected as Secretary:

Steve White

Phillips Driscopipe

Mr. White is the Manager of Geothermal Sales and Product Development for Phillips Driscopipe in Richardson, TX. His previous experience includes territory manager for Earth Energy Technology & Supply and territory manager for WaterFurnace International, Inc. He has ten years of experience in the geothermal industry.

During the forum on DOE's Super ESPC program, a VIP participant from Fort Huachuca mentioned some alternative contracting possibilities for GeoExchange installations that would have much shorter lead times than those experienced by the ESCOs.

"Let's talk," said Phil Schoen of Geo-Enterprises. Jack DiEnna from the Geothermal Heat Pump Consortium echoed that sentiment.

This connection was typical of what went on at this year's conference. People from different areas of the GeoExchange industry said hello, made connections, and shared information and opportunities. It was a time to teach, to learn, and to grow.

And speaking of growing, the number of products and services available to the GeoExchange industry is doing just that. The 1999 GeoExchange Conference and Expo said hello to several new concepts that hold great promise for expanding the industry and improving ground heat exchanger performance and cost (See "And the Winner Is ..." p. 4).

Lew Pratsch accepts the IGSHPA Lifetime Achievement Award.

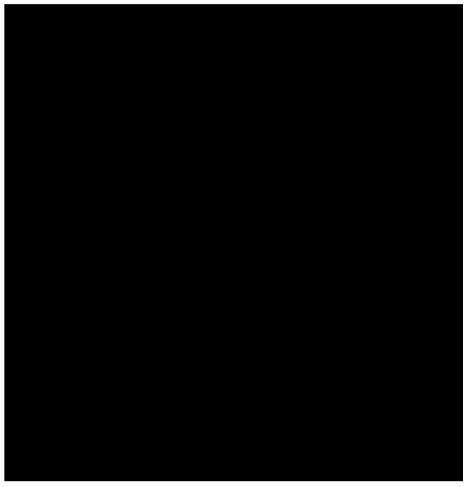
Conference attendees share their knowledge on the exhibit floor.

In the midst of all the hellos, this year's conference was a time to say good-bye to an old friend. With changes in the US Department of Energy's support of GeoExchange technology in the coming fiscal year, Lew Pratsch has been re-assigned to work with wind power technology.

First during the IGSHPA Advisory Council meeting, then at the general assembly meeting, Lew said his farewells to the people he has worked with so closely over the past several years. He was optimistic about the future of GeoExchange technology and the state of the industry, saying that GeoExchange technology "was around long before I came on the scene, and it's just going to keep growing."

Lew Pratsch may be leaving GeoExchange, but not empty handed. In addition to the service award given to him by Dr. Jim Bose of IGSHPA, Lew takes with him all the best wishes for success the GeoExchange industry has to offer.

As the conference was winding down to its inevitable close and all the hellos and good-byes had been said, participants said one final hello — to a bright future for the GeoExchange industry.



IGSHPA unveils "Geothermal...Dig It!" as the theme for the MayTech 2000 conference.

And the Winner Is...

By Robert Jones

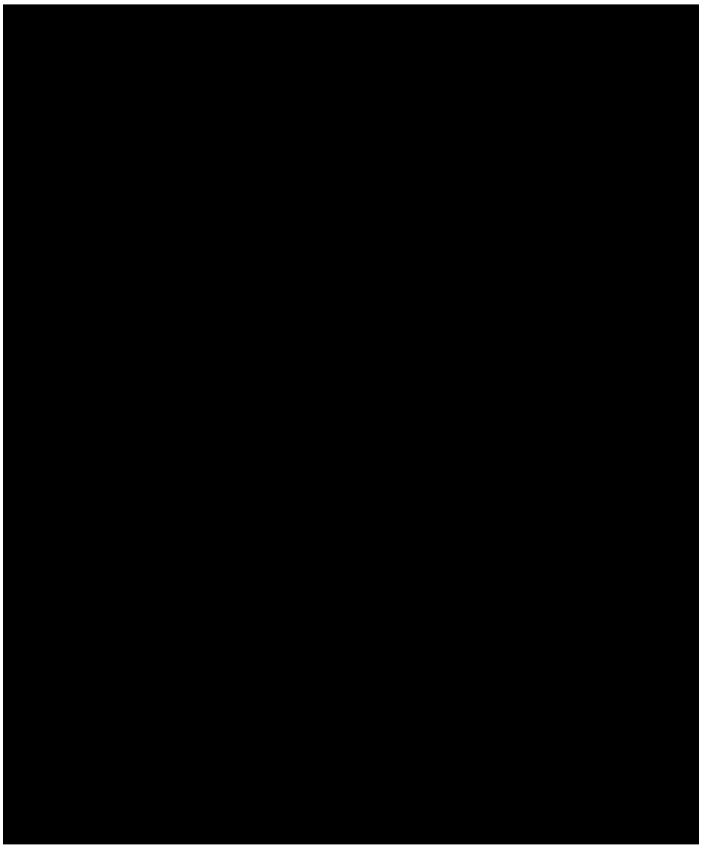
As I was browsing the exhibitor displays at the 1999 GeoExchange Conference and Expo in Sacramento, I saw many products that are like friendly landmarks on the road to a good geothermal installation. Products like Grundfos pumps, Phillips Driscopipe, and grouts by CETCO and Baroid Drilling were on display, as were heat pumps by WaterFurnace and FHP.

But alongside some of these familiar displays were booths promoting products and services less familiar to the geothermal landscape. As I was thinking about these innovations, it occurred to me that there ought to be some type of award to encourage the entrepreneurial spirit embodied in such ventures. So, being a man of modest means and even less technical expertise, I did the only natural thing. I decided to come up with my own set of imaginary awards for these innovators.

And now, without further ado...

The award for the product or service "Most Likely to Succeed" goes to Rick Nash of Geothermal Borehole Technologies for the "Geo-Clip." This simple little device attaches to both sides of a U-bend tube and is held together by the tremie tube used to grout a vertical borehole. As the borehole is grouted and the tremie pipe removed, the Geo-Clips spring outward, forcing the U-bend tubes against the wall of the borehole. According to preliminary data from Oklahoma State University, Geo-Clips installed on a vertical U-bend at 5 to 10-ft intervals cause an impressive performance increase over a conventionally installed vertical heat exchanger.

Next, the "Most Ambitious Concept" award goes to Lilli Cramer and Hardin Geotechnologies for their Geothermal Utility Return Line (GURL) system. While community heat exchangers are nothing new or controversial, using a city's potable water supply to heat homes has been met with a cool reception in



most quarters, and with good reason. Most people would not be comfortable drinking water that had been through someone else's heat exchanger. ("Put that glass down, Billy — you don't know where that

Rick Nash installs Geo-Clips on an experimental loop at OSU.

water's been!") Not only that, but a strict pump-and-dump design using the city's water supply and sewer system would be much too costly for the average consumer.

Hardin Geotechnologies has overcome both of these objections with the GURL system. The Geothermal Utility Return Line is a pressurized water line that is metered at the house and is available for all buildings along the line, just like a natural gas line. With this system, residential water is used as a heat exchanger medium and then returned to the water treatment facility via the GURL pipe, where it is tested, re-treated, and re-entered into the potable water supply. The GURL line is metered, and consumers are billed for the number of gallons they use, just as with their normal water bill. Residential customers no longer have to absorb the expense of installing a ground loop, and the water utility suddenly becomes an energy provider along with the "big boys" — electric and gas utilities.

"It's a hard sell," Cramer admits, but she has sold a GURL system to the town of Comanche, Oklahoma. The ribbon-cutting ceremony is scheduled for later this year. Soon we will see how well this type of system works and how well it is received by those using it.

Finally, there are some ideas that seem so obvious that I just have to slap myself in the head and say, "Duh!"

This year's "Most Obvious" award (a.k.a. "Why didn't I think of that?") goes to Tom Amerman at Enlink, Inc. for his small-borehole system. This system uses a specially designed U-bend joint and a cool-looking machine (called a Coil Tubing Unit, or CTU for short) to install vertical U-bends in smaller-diameter holes than normally practical. The resulting installation is faster and more cost effective.

The special U-bend joint they have developed has a third hole sized to receive the tube that the machine uses to push the loop into the borehole. Actually, it

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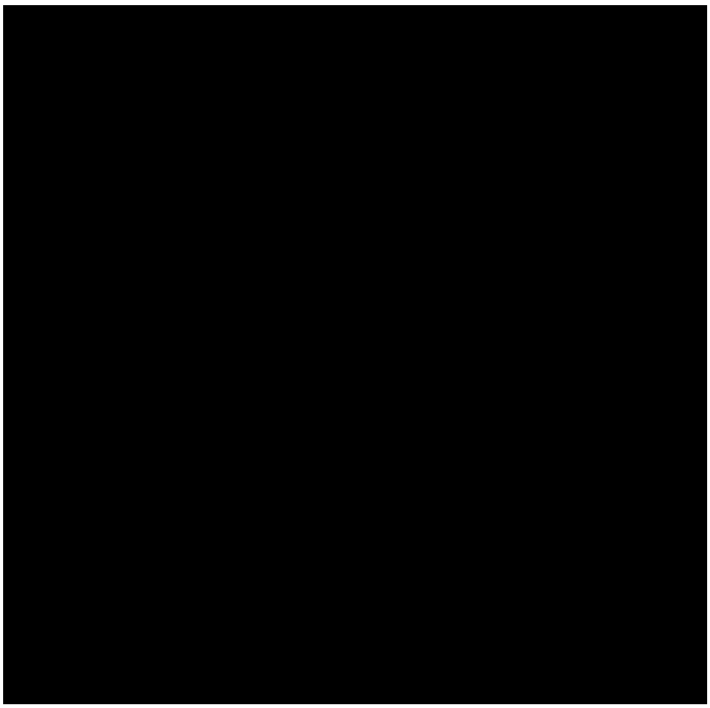


Lilli Cramer explains the GURL system to conference attendees.

Many participants stopped at Enlink's booth to discuss GeoExchange technology.

would be more accurate to say that the loop is pulled into the hole rather than pushed, since the pressure to get it downhole is applied at the bottom of the U-bend rather than at the top, as is usually the case. And the U-bend joint has a hole through the bottom that allows the operator to jet water down the hole to clear any debris that tries to block the progress of the U-bend. Once the pipe is at the bottom of the hole, the tube is used as a tremie pipe to grout the borehole quickly and efficiently.

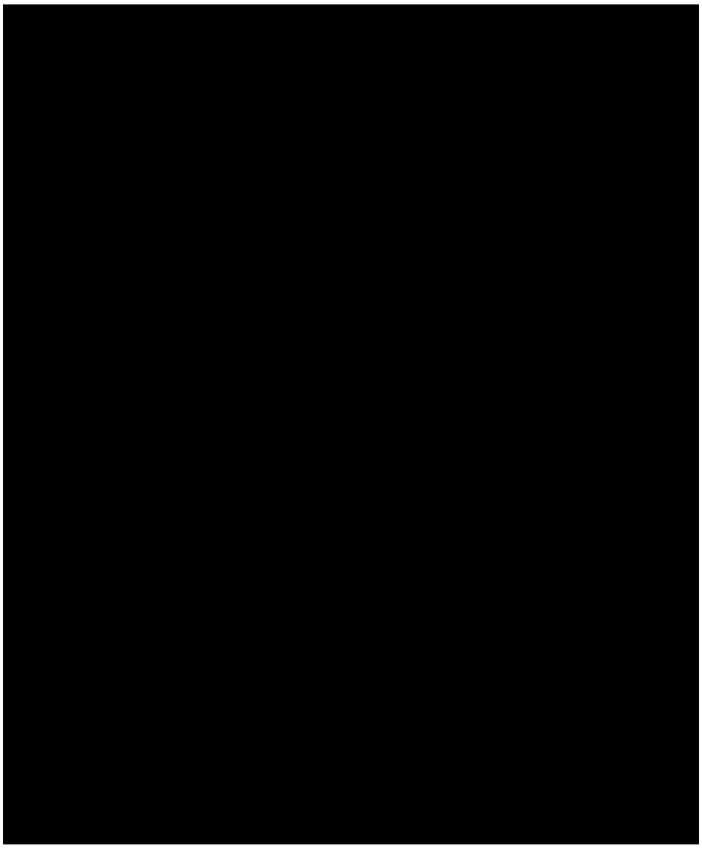
Savings with this system come from decreased drilling costs (the holes are smaller, and the driller does not have to install the loop), increased thermal efficiency of the heat exchanger, and a lower materials cost for grout mix.

Enlink offers an entire range of services for this system: everything from selling the individual U-bend joints to leasing the installation equipment or installing the loops in pre-drilled boreholes.

Well, that's about it for the awards ceremony, folks. Let's have a round of applause for our winners.

I hope to see you at the May Technical Conference 2000 in Oklahoma, where you and I can both learn more about these and other technologies. Who knows? I may even have to come up with more award categories.

Note: *The opinions expressed in this article are a product of the author's own perception of reality and do not necessarily reflect the views of IGSHPA's staff and management. (Although they probably should — I mean, really. Isn't it about time somebody started listening to me around here?)*



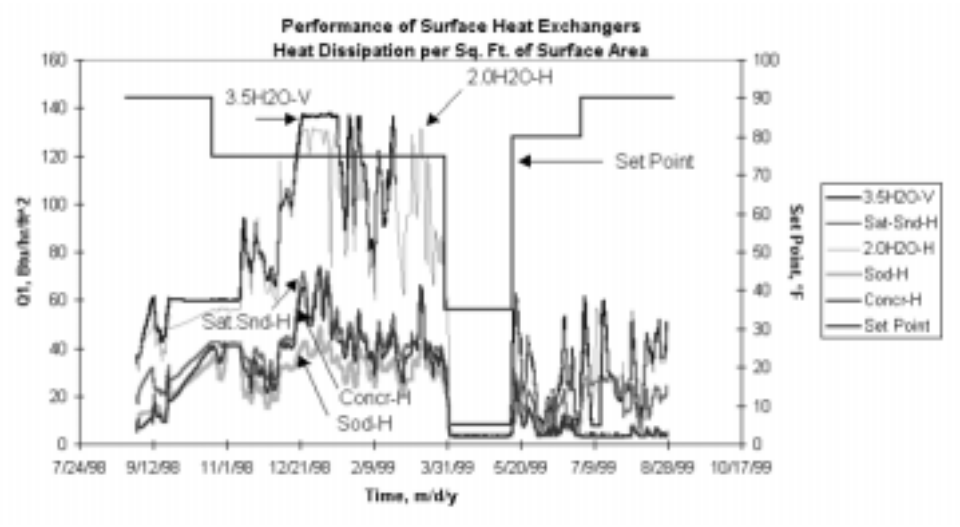
Shallow Heat Exchangers Show Promise

Part 1 of 2

Vertical heat exchangers have a tendency to build up heat over time, especially in large commercial applications in cooling-dominated climates. In order to overcome this difficulty, installers normally design loop fields large enough to handle about 20 years of heat build-up.

It goes without saying that increasing the size of the ground heat exchanger increases the first cost of the system, but what if it were possible to design a system based on a one-year load, rather than a 20-year life cycle?

Researchers at Oklahoma State University have been working on a new approach to this problem using supplemental shallow heat exchangers. Over the past year, Dr. Marvin Smith and his team have been studying the amount of heat dissipated by five different shallow heat exchanger systems.



A year's worth of data show the relative performance of the five test systems.

In each system, a Slinky heat exchanger is buried two feet or less from the surface in a different medium, and the temperature of the heat exchanger fluid is maintained at a given set point. The amount of power required to maintain this set point is an indication of how much heat is rejected through the system.

The heat exchangers in this experiment are buried horizontally under saturated sand, sod, or concrete, with the final two Slinkys situated horizontally or vertically in water.

Data have shown the water systems consistently outperforming all others, and the concrete system has the least favorable performance overall. Even so, this experiment has clearly shown the potential of using any type of near-surface heat exchanger to balance seasonal loads of vertical systems.

The next step in this experiment is a real-world trial. A local entrepreneur building a new restaurant in Stillwater, Oklahoma, has agreed to allow Dr. Smith and his colleagues to install a shallow heat exchanger system under the parking lot and walkway. Part 2 of this article will describe the design process and progress of this installation.

The control room houses the heating and circulation units, as well as the data collection system.