National Park Service Selects Geothermal

By Charles E. Elks Jr., P.E.

Cape Hatteras Lighthouse is located on the Outer Banks of North Carolina approximately 25 miles from the mainland. It is the nation’s tallest brick lighthouse at about 208 feet. The current lighthouse was built in 1868-70 and began operation in December of 1870. Along with the lighthouse there are three support buildings. The “Oil” House, the Double Keepers Quarters and the Principal Keepers Quarters. These structures are listed in the National Register of Historic Places and are managed by the National Park Service.

In 1870 when the lighthouse was built, it was 1500 feet from the ocean. In 1999 the ocean was about 100 feet from its base. The erosion from ocean wave action was threatening to destroy the lighthouse and all of the support structures. The plan to move the lighthouse began in 1989 and was completed 10 years later. The lighthouse was set on its new foundation on July 9, 1999. The relative position of the lighthouse to the other outbuildings was maintained. The new location is 1600 feet from the ocean. The lighthouse was moved a total of 2900 feet. The American Society of Civil Engineers (ASCE) named this project the 2000 Outstanding Civil Engineering Achievement (OCEA).

The Double Keepers Quarters and the Principal Keepers Quarters are no longer lived in, but are preserved as a museum and bookstore where visitors can view relics from the “Graveyard of the Atlantic” as this location is called (more than 2200 ships have sunk off the Outer Banks since Europeans first arrived).

In order to protect this historic architecture and its surroundings from modern appearances, which are not allowed, the National Park Service selected a close loop of geothermal heating and cooling system for this historic site. The lighthouse itself is not air conditioned or heated, but the Double Keepers Quarters and the Principle Keepers Quarters were to be conditioned.

Just east of the lighthouse and the historic site, a restroom facility was constructed. The architecture of this building was to be in keeping with the architecture of the Outer Banks.

(see Lighthouse on page 3)
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Election Year
This Presidential election year is a reminder of how important it is to participate in the process that will determine the direction of your association. The leadership of the IGSHPA Advisory Council has a significant impact on the continued development of the ground source heat pump industry. Advisory Council members are elected to serve for three-year terms.

Four current members of the Advisory Council roster will be up for re-election:
- Frank Migneco, GPU
- Morris Lovett, OG&E
- Steve White, Performance Pipe
- Howard Newton, Trane/Command-Aire

Two IGSHPA members in good standing must nominate each of these candidates. The membership may also nominate new individuals to stand for election. If you are interested in serving IGSHPA, you may nominate yourself.

Nomination ballots will be e-mailed in November to all members. Members who have not notified IGSHPA of their current e-mail address need to do so ASAP. This information is important for the election, but also for inclusion in the upcoming 2001 Membership Directory.

Big Savings on 2001 Membership Dues
Membership dues for all IGSHPA members are due no later than December 31, 2000. Dues will increase 15% after this date. Invoices have been mailed – send your check today.

Don’t Be Left Out
In addition, if you want to be listed in the 2001 Membership Directory we must receive your dues by December 31, 2000. Look for further information to be mailed about special advertising in the Directory.

Energy Management Congress
The Association of Energy Engineers (AEE) is presenting the West Coast Energy Management Congress, May 9-10, 2001, San Diego, California. For more information on participating in the Congress call 770-279-4390.

WaterFurnace to Conduct Training
WaterFurnace International will be conducting Technical Training Seminars for their products throughout November. Classes will be held in Oklahoma City, OK Austin, TX, and Chesapeake, VA. An additional seminar on Right-Suite software will be held in Allentown, PA. Call 800-222-5667 for more information or visit their website at www.waterfurnace.com.
Lighthouse (continued from page 1)

A geothermal system was selected by the National Park Service at the Denver Service Center located in Denver, CO. The geothermal system not only provides a heating and cooling system that can be hidden from view, but a system that is environmentally protected from the elements. Cape Hatteras is one of the most corrosive locations in the world as salt spray from the ocean is nearly constant. The average life for outdoor air conditioners is about four years before it has rusted away. Galvanic action on the aluminum fins will dissolve them leaving nothing but the copper tubes. The geothermal piping system will last “forever”. The heat pumps are within the conditioned space and will last as long as any where else — at least 20 years.

By the time standard units are replaced four times in 20 years, the geothermal system is the most economical system just from life expectancy. The exceptional operating efficiency of the geothermal system compared to a standard system is a bonus!

The Principal Keepers Quarters has three FHP model GT022 units and five 1 inch unicoils inserted in 150 foot deep vertical bore holes. The Double Keepers Quarters has four FHP model GT022 units and seven - 1” unicoils in 150 foot deep bore holes. The subsurface conditions are saturated sand and the water table is approximately 6 feet from the surface. This provides for ideal heat transfer conditions.

In addition to the historic buildings the restroom facility is heated and ventilated with a FHP model WP060 water to water geothermal chiller-heater. This unit provides chilled or hot water to an International Environment Corp. fan coil unit to provide conditioned ventilation to the restroom.

The park service also chose to use environmentally friendly refrigerant R-407C for its non CFC properties. R407C is chlorine free and has an ozone depletion factor of zero.

The general contractor for phase II of the project was JHC Inc. Phase II was the infrastructure contract to support public use. The heating and air conditioning subcontractor was Fauquier Heating and Cooling from Rhoadesville, VA. The geothermal loop contractors were Virginia Energy Service from Richmond, VA and Pinkston Well and Pump from Virginia Beach, VA. The heating and air conditioning products were supplied by Mechanical Equipment Sales Inc., Virginia Beach, VA.

See http://www.nps.gov/caha/ on the Internet for in depth articles about Cape Hatteras.
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Commissioned by Devon County Council, the Earth Energy system was designed and installed by GeoScience Limited of Falmouth, Cornwall in conjunction with Thermoboard of Exeter and Kensa Engineering of Falmouth. The Beutot heat pump was supplied by ClimaGas Limited.

Further details and photographs available from Debbie Allen at GeoScience Limited Tel: 01326 211070.

More information on EarthEnergy systems can be found at: www.earthenergy.co.uk

More information on Stover Country Park is available on-line at: www.devon-cc.gov.uk/dcs/stover/centre.html

Pond loop system delivers efficient heating and cooling to the Stover Country Park Centre.
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IGSHPA publications are used and seen by industry professionals everywhere. Our Membership Directory is sent out to over 2,000 businesses and individuals in the industry and is one of our most requested publications. In addition, the 2001 Membership Directory will be available for purchase by non-members at conferences, trade shows, and the IGSHPA website.

The Source is a bimonthly newsletter received by all of IGSHPA’s members: architects, utility companies, manufacturers, builders, engineers and others in the geothermal heat pump industry.

Both go out to people in all 50 states and 13 countries; an average of 55 new installers are accredited by IGSHPA each month and each one receives a year’s subscription to The Source and a Membership Directory.

Until December 15, 2000 special rates are available for advertisers in both The Source and 2001 Membership Directory.

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800-626-4747.
Iggy Finds Sharks in Atlantis

What does a groundhog from Oklahoma have in common with a 120,000-gallon shark tank in New York? The belief in the awesome versatility of ground source heat pump technology of course. This common interest will bring together Atlantis Marine World; the International Ground Source Heat Pump Association, a division of Oklahoma State University; Long Island Power Authority; and Cornell Cooperative Extension Marine Program, a community education component of Cornell in an educational outreach effort.

IGSHPA introduced its mascot, Iggy, in 1988. To effectively communicate to a new generation the benefits of heat pumps, a coloring-book was developed and distributed to grade-school age children. The friendly groundhog, Iggy, and his friend, Otis, explained in the coloring book how to use ground source technology in a simple yet effective manner. Now, Iggy will be joining forces with Atlantis Marine World to tell the thousands of young people who visit the New York aquarium about the unique use of heat pumps at this facility.

Early in the facility planning stages, the forward thinking managing partners of the aquarium, Jim Bissett and Joe Petrocelli, searched for the most cost-effective and environmentally friendly way to heat and cool the aquarium tanks. With the help of Ken Carrara, Senior Product Consultant for the Long Island Power Authority and the Geothermal Heat Pump Consortium (GHPC), Bob Dooley, RJ Dooley & Associates, Poughkeepsie, NY, was hired and designed the 150-ton geothermal system. Bertram Drilling, Inc. drilled the 80 boreholes and installed the 285 feet of pipe for the aquarium. Five, 30-ton WaterFurnace heat pumps, were installed and now power the system.

Atlantis Marine World is privately funded and the first large-scale aquarium and research facility to be built in New York in 35 years. Atlantis Marine World opened to the public on June 15, 2000, with 80 exhibits and the largest coral reef display in North America. It is home to over 8,000 animal specimens representing 500 species from around the world. Included in the exhibits is a 120,000-gallon shark display featuring the ruins of The Lost City of Atlantis.

IGSHPA has agreed to work with Atlantis Marine Aquarium to modify the IGgy coloring book to include details on the tanks whose temperature is geothermally regulated. The revised coloring book should be ready for distribution during educational functions by IGSHPA and Atlantis Marine Aquarium by the end of the year.

To learn more about this program, attend the IGSHPA Annual Conference and Expo in Norfolk, VA. Mr. Ken Carrara, Long Island Power Authority, will be a featured speaker. You can also access the Long Island Power Authority web site @ www.lipower.org. Questions about Atlantis Marine World should be directed to Karen Wightman, Director of Marketing, at 631-208-9200, extension 108. For additional information on the exciting events at Atlantis Marine World visit their web site at www.atlantismarineworld.com.

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