



# Lighthouse Terrace Housing Pensacola NAS, Florida



Already tight on funds for military family housing, Pensacola Naval Air Station (NAS) housing personnel knew that the natural gas lines serving a housing complex scheduled for renovation were deteriorating and would need to be replaced. They met with Gulf Power to determine if there was any way to reduce renovation and energy costs. After a lot of hard work and persistence by Navy and utility personnel, GeoExchangeK proved to be the answer.

Lighthouse Terrace is a military family housing complex at the Pensacola Naval Air Station that includes 236 residential apartments ranging from two to four bedroom each. The units are arranged in a townhouse configuration. Four to six units are grouped in a single building — the three- and four-bedroom apartments are housed four units per building and six of the smaller, two-bedroom apartments are incorporated into a building.

## Renovation Innovation

“Basically what we did was to gut the entire building -- the only thing left standing were stud walls and concrete foundation,” says NAS Pensacola Housing Director Ms. Rudy Weber. Wall and attic insulation were replaced. Low-flow shower heads “that actually work” were included in the package of energy conservation measures that the units received. Existing windows and doors were replaced with energy-efficient models.

“Probably one of the things that we are most proud of is our geothermal system,” says Ms.

Weber. “Initially the project was designed to replace the gas furnace that was already in the unit. However, we seem to continually have problems if we have a gas outage. We generally are required to pay someone overtime to come back out and light pilot lights. We have to worry about deteriorated gas mains.”

“Gulf Power offered us a \$500 rebate per housing unit for a grand total of \$118,000 which would allow us to proceed with the geothermal installation,” said Ms. Weber. “That’s how we have gotten to where we’re at now -- with the support of Gulf Power, working with the Navy, looking at how much energy we would save in the future. Not only energy savings, but maintenance savings” figured prominently in the Navy’s decision to go with GeoExchange.

## Utility Assistance

When the Navy base decided to renovate the housing complex, they called in Gulf Power to make recommendations on the most energy-efficient measures and practices. "We came in and calculated their heating and cooling needs for these units and helped them understand their energy loading needs," said Mark Dreadin of Gulf Power's Pensacola District Engineering. Gulf Power recommended a package of energy saving measures that included GeoExchange systems as well as substantial thermal improvements as part of their Good Cents program.

"They are renovating from the ground floor on these units and bringing them up to Good Cents standards," said Richard Adams of Gulf Power's Pensacola District Marketing. "With the Federal government's interest in geothermal, this project is very important. It's going to serve as a hallmark for other areas of the country."

"A lot of people were involved and had a role in making it happen," said Adams. "We came in and showed the Navy what we felt was most energy efficient and they agreed with us."

### **Phased Construction**

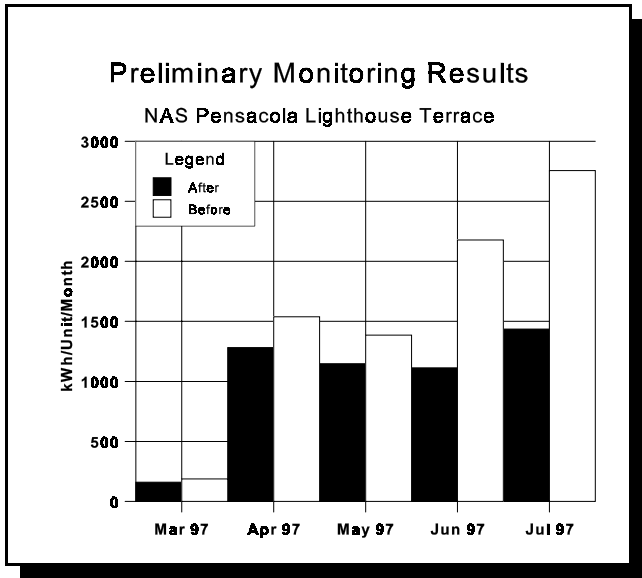
"We completed 14 housing units that will serve as our model, and will give us a guide, allow us to make changes and complete the remaining units," notes base Housing Director Ms. Rudy Weber. These Phase I living units at the Lighthouse Terrace complex have been occupied for about ten months (see Figure 1). The 12 units comprising Phase II of the project have been occupied for only a month. Renovation of 34 additional units is now underway on the third phase of the project. Eventually, all 236 living units at the Lighthouse Terrace complex will enjoy the energy and comfort benefits of GeoExchange combined with the Good Cents package of conservation measures.

Each phase was separately bid. The Phase I GeoExchange systems were installed by local Pensacola contractor Energy Systems Air Conditioning Company. Georgia Geothermal of Columbus, Georgia, was awarded the second and third phases.

WaterFurnace AT Premier Series GeoExchange units were installed in Phases I and II. However, the more basic Spectra Series has been selected for Phase III. For the first phase, two to three GeoExchange units are served by a single ground loop heat exchanger. However, each unit has its own separate ground loop in the second and third phases of the project. The vertical wells are 200 to 225 feet deep. Each well serves about one ton of cooling load. The two- to four-bedroom living units have cooling loads (after thermal improvements) of between 1½ and 2½ tons.

### **Gulf Power is Monitoring Energy Savings**

To verify estimated energy savings, Gulf Power is currently monitoring two of the four-unit buildings. One of the buildings has been totally renovated including installation of GeoExchange, thermal improvements, lighting retrofits, and new refrigerators. The other monitored building has not been retrofitted giving a good before and after picture of energy savings. Each unit in the un-renovated building has a furnace, water heater, and stove fueled by natural gas, and an electric air conditioner. The two buildings are in close proximity to each other and are similarly oriented to the sun.



Electric Consumption per Dwelling Unit Before and After Renovation

The electricity use of each apartment in the two buildings is separately metered. One gas meter installed in the un-renovated building measures of total gas use of the four "before renovation" apartments.

Electricity use has been monitored since March 7, 1997, and the natural gas since April 15, 1997. Monitoring results to date are shown in Figure 1. GeoExchange, thermal improvements, and other measures have reduced the average monthly electricity consumption by approximately 36 percent. Natural gas consumption has, of course, been entirely eliminated.

Ms. Weber notes that other housing complexes at the base are being renovated with new gas heating equipment. The idea is to have several different types of heating and cooling equipment in family housing so that they may be compared in terms of cost, performance, and maintenance. So far, the GeoExchange units are more than holding their own. While very pleased with GeoExchange technology,

the Navy does not endorse any specific product or manufacturer.

**Additional Benefits**

It may be too early to tell the full impact of the GeoExchange system on maintenance at the base, but preliminary indications are that in the 10 months that the Phase I units have been occupied there have been significantly less service calls than at another complex renovated with gas units at the same time GeoExchange went in Lighthouse Terrace.

The GeoExchange system is also providing hot water for Lighthouse Terrace residents. By recovering excess heat from the refrigerant, all the residents' summer hot water needs will be met for free. Winter hot water energy use will also be a fraction of pre-renovation levels thanks to GeoExchange.

**Ask Your Counterparts About GeoExchange**

The best way for you to determine if GeoExchange is right for your military housing application is to ask your counterparts at other bases who have tried it. The list of key players below allows you to ask questions of those that were in your position not so long ago. We have found that GeoExchange customers love to talk about their systems.

## **Key Players**

### **Electric Utility**

Gulf Power Company  
500 Bayfront Parkway  
Pensacola, FL 32520-0231  
Keith Swilley, Marketing Manager, (904) 872-3202  
Bob Magee, Military Segment Specialist, (850) 444-6013  
David Shell, Residential Market Specialist, (850) 444-6021

### **Facility**

Pensacola Naval Air Station  
1581 Duncan Road  
Pensacola, FL 32508  
Ms. Rudy Weber, Housing Director, (850) 452-5289  
Harry White, Public Affairs Officer, (850) 452-2311  
Leo Deposito, Navy Public Works Center,  
Project Manger, (850) 452-4774

### **Mechanical Contractors**

#### ***Phase I:***

Energy Systems Air Conditioning Company  
1027 South Fairfield Drive  
Pensacola, FL 32506  
Tommy Marshall, President, (850) 456-5612

#### ***Phases II and III:***

Georgia Geothermal  
P.O. Box 4252  
Columbus, GA 31904  
Charles Davis, (800) 213-9508

### **GeoExchange Manufacturer**

WaterFurnace International, Inc.  
9000 Conservation Way  
Fort Wayne, IN 48809  
(219) 478-5667