

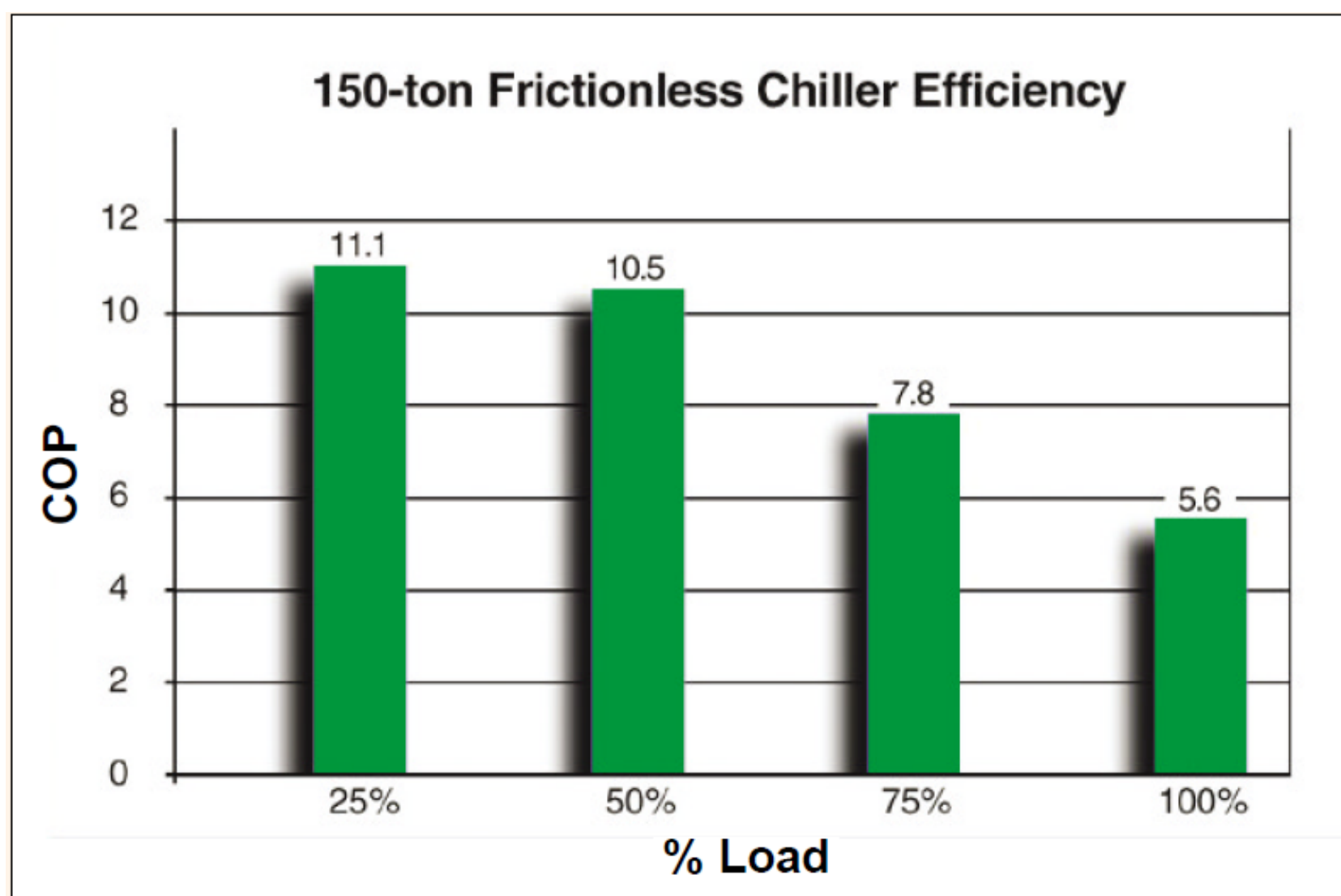
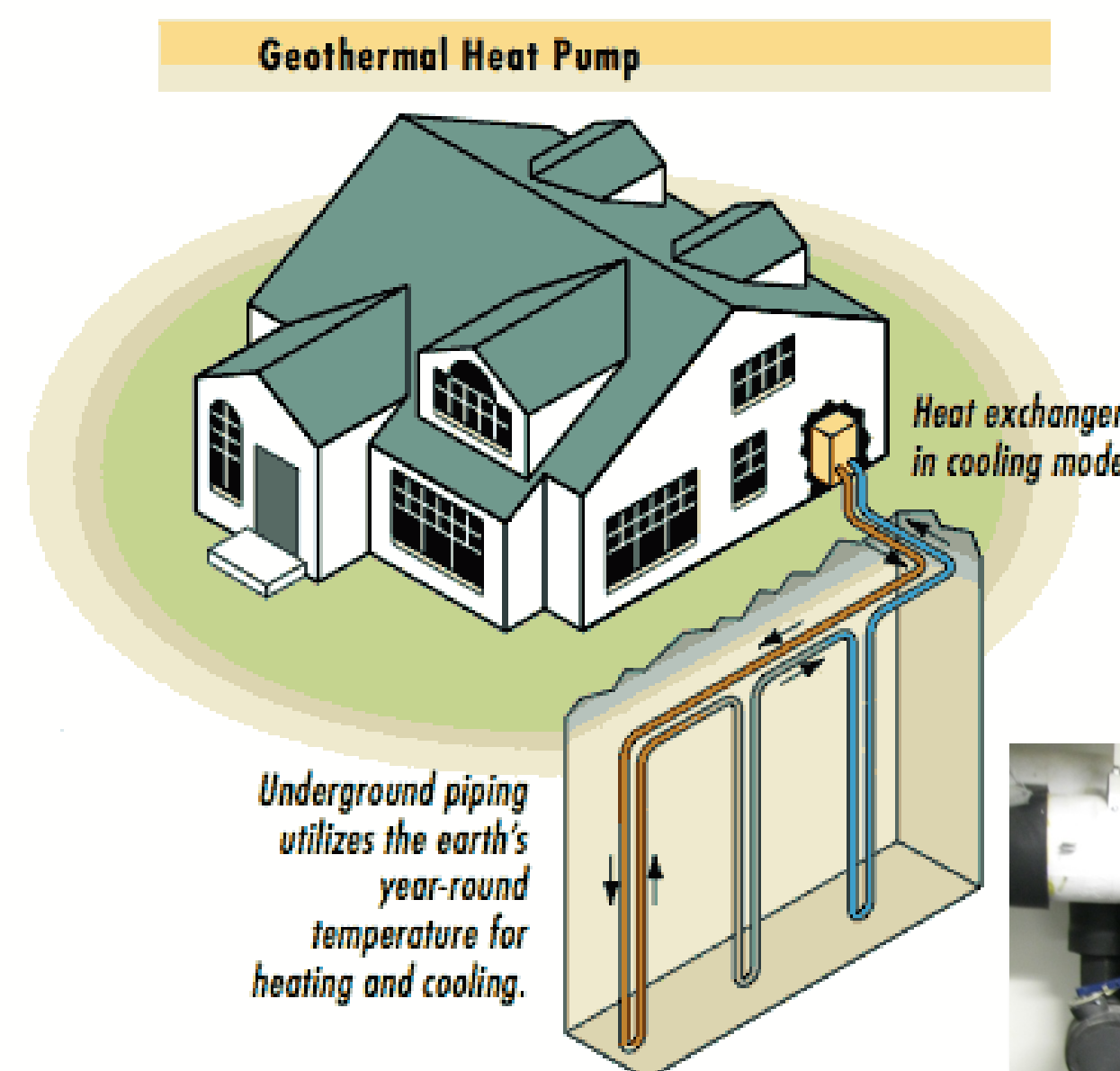


Shaw AFB HVAC Efficiency Projects



Technologies Implemented:

- * **Renewable Energy - Geothermal Heating and Cooling**
 - * Ground Source Heat Pumps utilize constant temperature of earth as heat transfer source
- * **Frictionless Chillers with Variable Speed Drives**
 - * Utilizes magnetic bearings, eliminating power consumption of compressor to overcome friction of mechanical bearings
 - * High efficiency performance at part load
- * **Direct Digital Controls (DDC)**
 - * Offers remote monitoring and control of HVAC system components
- * **Retro-commissioning**
 - * Ensures HVAC systems in existing buildings are designed, installed, tested, and operating according to facility requirements

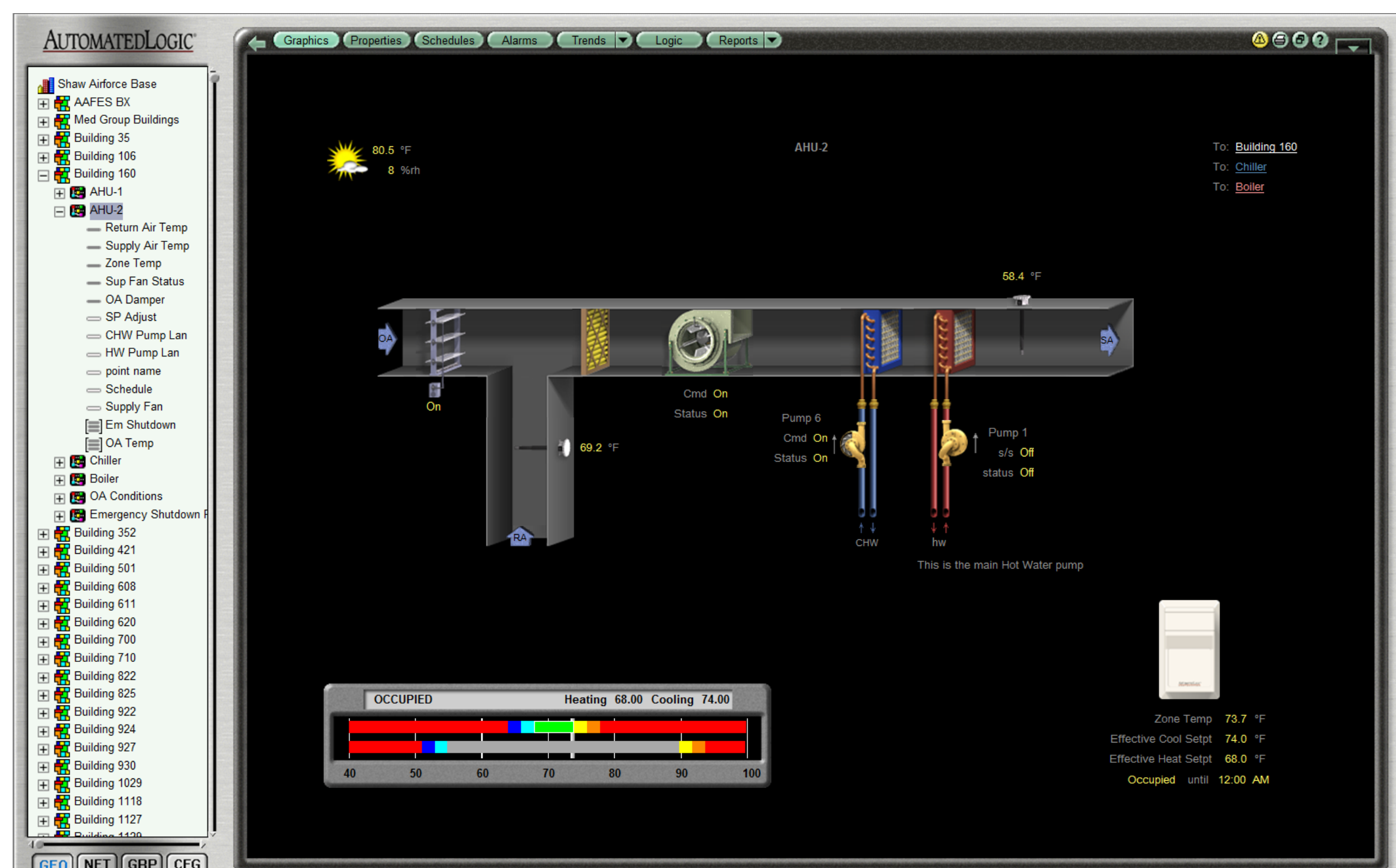


Energy/Cost Savings:

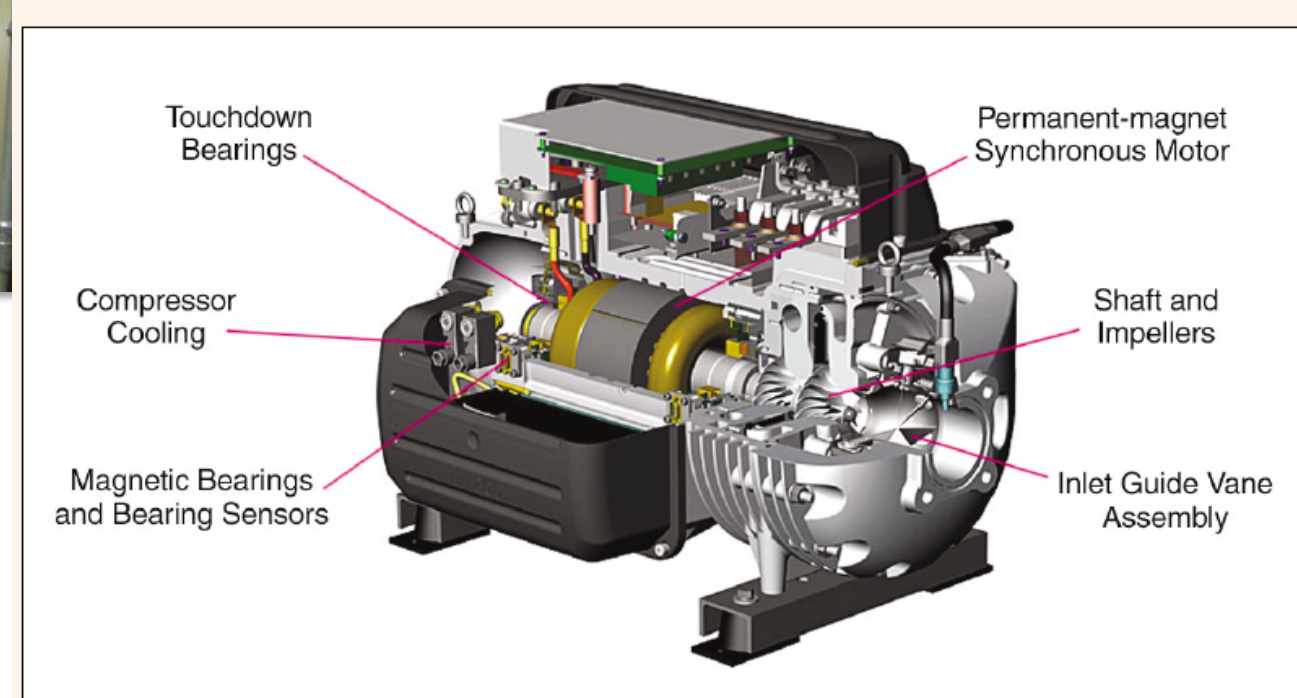
- * **Frictionless Chillers with Variable Speed Drive:**
 - * 40% more energy efficient than standard centrifugal chiller
- * **Direct Digital Controls of HVAC Systems:**
 - * Saves approximately 6,600 MBTUs/yr
 - * \$104,000/yr energy savings; \$17,500/yr maintenance savings
- * **Geothermal Ground Source Heat Pumps:**
 - * Minimizes electrical energy consumption by 30% compared to standard HVAC system
- * **Retro-commissioning Actions in 5 Facilities:**
 - * Reduces utility costs by \$28,000/yr

Example Facilities Included:

- * **B419 & B421 - Dorms**
 - * Installed Geothermal Ground Source Heat Pumps
- * **B417 & B501 – Dining Hall & Education Center**
 - * Retro-commissioning measures implemented
- * **B1947 – ARCENT HQ (Patton Hall)**
 - * Installed Frictionless Chillers
- * **B1401 & B922 – Bowling Alley & Carolina Skies**
 - * Upgraded HVAC with DDC



Mechanical components of the Danfoss Turbocor compressor are controlled by onboard digital control electronics to manage compressor operation while providing external control and web-enabled monitoring access to a full array of performance information.



Future Projects:

- * Continue to upgrade and expand facilities HVAC systems with Direct Digital Controls
- * Replace outdated heating systems with high efficiency Infrared Radiant Heaters
- * Remove all oil fired boilers from facilities and replace with efficient natural gas condensing boilers