

# Lackland AFB, TX

## US Air Force 0.79 MG TES Tank

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Siemens Building Technologies, a leading Energy Services Company (ESCO), selected Natgun to build a 792,000 gallon Thermal Energy Storage (TES) tank at Lackland AFB near San Antonio, TX. Through a design-build performance contract, Siemens Building Technologies provided the base with several utility savings and infrastructure improvements that included adding a TES tank to one of the closed loop chilled water distribution systems at the base. The TES tank provides the energy management staff at Lackland AFB the flexibility to operate their chilled water cooling system more efficiently by allowing the chillers to operate during night-time and off-peak hours instead of during the afternoon, the hottest part of day.

The refrigeration equipment (the chillers and cooling towers) that provide the cooling for the closed loop chilled water system operates most efficiently at night-time during cooler ambient conditions. During these off-peak nighttime hours, the chillers operate at full load to “charge” the TES tank with cold water. Then during the hot daytime hours, the chillers and cooling towers are de-energized, and the cold water is “discharged” from the TES tank and circulated through a district cooling network of piping to the buildings. By operating in this way, Lackland AFB has reduced their electric energy consumption and reduced their energy costs. Siemens Building Technologies estimates that the annual savings associated with the TES system will be over \$79,000.

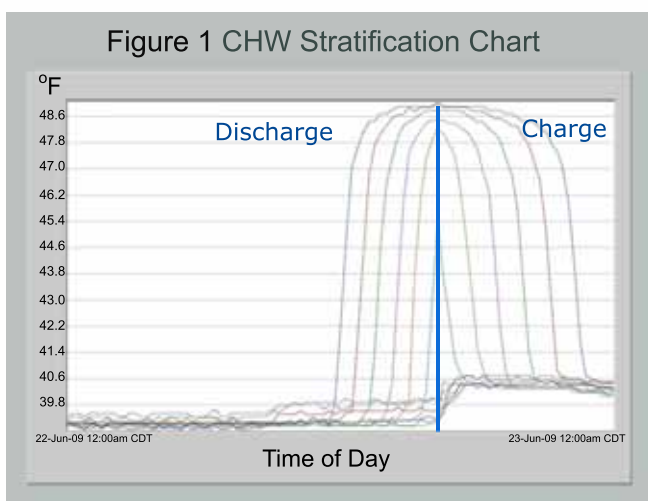


Figure 1 is data that illustrates the stratification of the water inside the TES during the discharge and charge cycles. Over a period of several hours the TES tank was in the discharge mode. During that time the temperature sensors (mounted vertically every 3 feet) and energy management system recorded the readings. At any moment during the discharge cycle, it was observed that each sensor recorded a predictable rise in temperature as the warm water at the top of the tank gradually displaced the cold water at the bottom of the tank. Then during the charge process, the cold water entered the bottom of the tank, and recorded temperature patterns indicated a very systematic pattern of change that typifies the proper stratification of the cold and warm water in the tank throughout the entire cycle.

Natgun TES tanks are built watertight and maintenance-free ensuring owners of decades of continuous service.



### Thermal Energy Storage Tanks

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