

Thermal Energy Storage Center



The University of Illinois at Urbana-Champaign is adding a Thermal Energy Storage (TES) tank to the Campus Chilled Water System (CCWS).

The tank is located on South Oak Street in Champaign, adjacent to the NCSA Petascale Computing Facility.

Purpose

The 6.5 million gallon tank will help meet ~7,000 tons of additional cooling requirements for building projects being completed in 2010.

Anticipated loads include:

- Ikenberry Student Dining and Residence Hall
- NCSA Petascale Computing Facility (PCF)

Also included are new loads for upcoming projects:

- Remodel for Lincoln Hall (starting construction)
- Remodel for Assembly Hall (in the planning stages)
- New Electrical and Computer Engineering Building (currently in design)

The TES project goal is to meet these needs without increasing the number of chillers.

Operation

The TES tank will be integrated into the existing chilled water system as part of a larger project to expand the Campus Chilled Water System (CCWS).

- The CCWS has extensive underground piping connecting 93 major campus buildings to its 4 chilled water production plants. Chillers provide the necessary chilled water to cool buildings through their air conditioning systems.
- The buildings place ~34,000 tons of connected load on the 4 regional chilled water production plants with a total of 18 chillers (steam and electric).
- The current production in the 18 chillers and the 50,000 ton-hour TES tank will enable the system to serve an additional ~8,000 ton load (for a 6 hour peak period).
- The TES system allows the production of reserved chilled water capacity at night during off-peak hours when electricity costs are low.
- The TES tank will be charged at night by operating existing chillers as building loads subside and electric costs are decreased. It will be discharged during afternoon peak cooling periods thus allowing chillers to be turned off when electric costs are highest.
- The tank will remain full at all times as it is charged and discharged via pumps located in an adjacent pump house. The tank and pumps are connected to the CCWS through 30" diameter piping.

Background

Scope: 6.5 Million gallon tank
 Tank Cost: ~\$3,700,000
 Construction Start: Summer 2009
 Substantial Completion: Summer 2010

System Design:

F&S Engineering Services

Project Management:

F&S Construction Management

System Operation:

F&S Energy Services

Project Architect/Engineer:

Henneman Engineering, Inc.

Consultants:

GLHN and CoolSolutions

Tank Supplier:

Caldwell Tanks, Inc.