



CPECS

Optimized variable speed solutions for new and existing chilled water plants



A variable speed chiller's performance is directly related to cooling tower temperature and flow rate. An increase of 1°F (0.56°C) in condenser water inlet temperature may impact chiller performance by as much as 2.8%.

Accurate cooling tower control and an optimized total system energy approach is essential in an efficient chiller plant. Typical cooling tower control neglects trade off between fan energy and chiller energy at part load.



INTELLIGENT DECISIONS

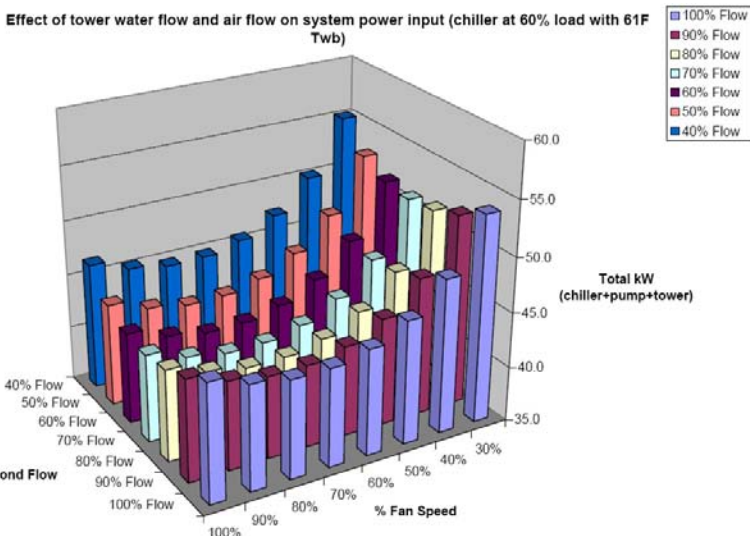
Central Plant Energy Control System

Typical building automation systems control equipment via fixed set points and schedules. These systems have limited knowledge of the actual equipment being controlled and how their performance changes at different operating conditions.

Example:

A BAS controls a cooling tower to a fixed 78°F, chillers are sequenced on once they reach full capacity, chilled water set point is adjusted based on a fixed time of day schedule and chilled water pumps operated to maintain a fixed pressure.

Typical strategies such as above have been proven to consume as much as 75% or more energy at part load when compared to a CPECS plant all as a result of the typical system not having the calculation horsepower to make complex equipment performance calculations.



PART LOAD PERFORMANCE

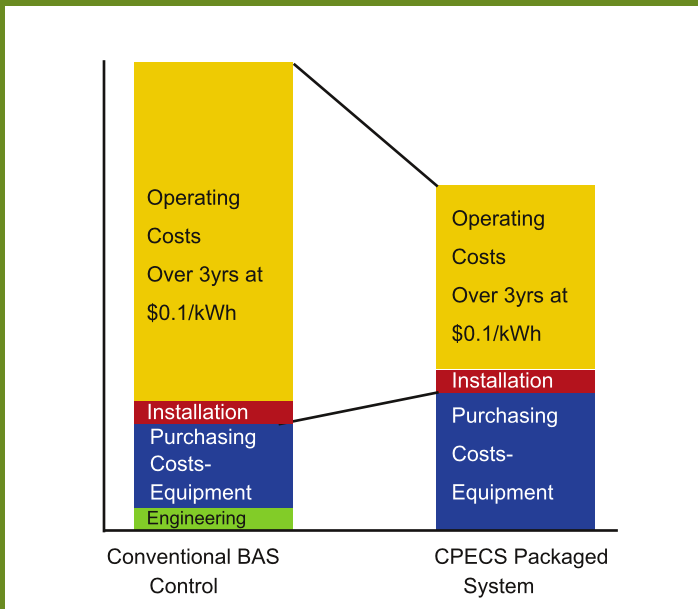
HIGH POTENTIAL FOR IMMEDIATE SAVINGS

The CPECS software has complete knowledge of compressor, tower and pump performance characteristics which it uses in real time to modulate control levels to all VFD's and provide the maximum level of system performance while respecting chiller flow, temperature limits and occupant comfort. The result is a central plant that operates in synchrony to deliver the highest possible total performance.

Unlike other static optimization strategies CPECS has the ability to self correct chiller, tower and pump performance maps such that regardless of wear and tear, inaccuracies in manufacturer's data or off design conditions your plant will always run at peak efficiency. CPECS goes past the central plant and out to the AHU's continuously scanning specific data points in order to balance central plant performance with air side performance without sacrificing occupant comfort.

Any time a variable speed chiller plant operates at a capacity less than its maximum there exists an opportunity for optimization of set points and flows without compromising occupant comfort or process temperatures. ASHRAE studies conclude that air conditioning applications operate at part load over 96% of the time.

The CPECS web interface displays actual plant performance in real time to the operator placing utmost focus on efficiency. All CPECS control systems have the ability to remotely warn of equipment failures or poor efficiency via a built-in email server. Each installation deploys with a full enterprise SQL database that resides on the site (all data owned and under control of the owner).



Phoenix, AZ. The pre-engineered and factory assembled CPECS all variable speed plant optimization solution demonstrated greater than 30% total site electrical consumption savings yielding rapid return on investment.



Flexible deployment model

The CPECS system may be delivered as a complete controls package with VFD's, control cabinet, touch panel, I/O hardware or as a networked smart box deployed on the BAS backbone (BacNet, Lon, Modbus & N2 capable).

Reduced risk

CPECS systems are factory designed and tested, guaranteeing quick installation and trouble free startup. Plant controls may be shipped with complete drop-in-place enclosure or as a modular kit for existing plant room installation.

CPECS Achieves Optimization Via:

- Optimized cooling tower control & sequencing.
- Chiller sequencing that seeks lowest kW for the capacity.
- Variable speed, variable set point chilled water pumping.
- Optimized VFD condenser water pump control.
- Optimized pump sequencing.
- Chilled water reset based on actual AHU demand.

CPECS Features:

- Energy report generation & condition monitoring.
- 7yr onsite and offsite historical data storage.
- Internet remote monitoring and control.
- Chilled water flow monitoring as standard.
- Open programming language & open protocol.
- Easily integrates into existing BAS network.
- Carbon usage reporting.
- Demand reduction modules available.
- More than 100 installations across multiple continents.
- Units ship assembled on truck ready for placement.

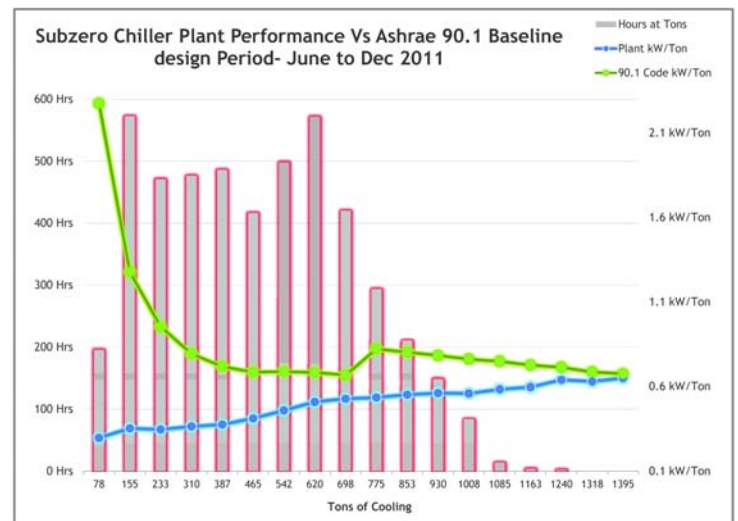
Better technology, greater savings

CPECS has achieved annual total plant operating efficiencies of 0.48kW/Ton (7.3 COP) and better. These results far exceed today's energy efficiency code requirements and defy conventional thinking.

Each plant is installed with its own flow, electrical and temperature metering, which enables the owner to view plant efficiency in real-time. In addition to electrical savings, reductions of up to 10% in tower water consumption can be realized.

CPECS plants offer connectivity to:

- Modbus RTU.
- Modbus TCP/IP.
- BacNet.
- Lon.
- N2.





Measurable results,

CPECS allows immediate evaluation of savings via the use of a realtime baseline calculation. Baseline performance can be programmed as a 90.1 code compliant plant or a custom baseline that evaluates actual performance against a pre-retrofit value.

The CPECS web interface unlike any other chiller optimization software delivers to the user actual performance, baseline and most importantly **target performance** indicator. Other optimization providers cannot deliver a realtime performance target as a result performance shortcomings are not realized until too late.

SERVICES OFFERED

Variable speed chiller plant optimization design and planning.
Energy consultation for mid to large chilled water plants.

Ask us how we can help with air side optimization and demand response strategies along side CPECS.



CPECS graphical interfaces are user friendly and can be viewed from anywhere via the internet. Standard graphics packages are available for one to four chiller plants, custom graphics available upon request.



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