

Chiller Plant Optimization: What is it?

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Target opportunity

- Water cooled centrifugal chillers
- 300 tons of cooling or more
- More run hours the better including plate & frame free cooling

Benefits

- Annual kWh savings > 200,000 kWh annually
- Payback 2-5 years
- Eligible for custome utility incentives

What is optimization

All parts of a system working together as single unit



A single component is not optimization

Maximizing the efficiency of a single component of a system is not optimization



Optimization vs. Chilled Water Control Alternatives

	Relational Control	Typical Chilled Water (CHW) Control
Cooling tower and condenser pump control	<ul style="list-style-type: none">• strategy for minimizing total chilled water plant energy using real-time mathematical power (kW) relationships of the equipment• Always provides the best total central utility plant C.O.P. i	<ul style="list-style-type: none">• VFDs are used as balancing devices or in order to maintain a delta T across the condenser bundle
Chilled water pump control	<ul style="list-style-type: none">• Valve orifice method	<ul style="list-style-type: none">• Some strategies involve resetting the chilled water differential pressure based on worst-case zones (trim and response)
Chilled water reset	<ul style="list-style-type: none">• Sweet spot optimization	<ul style="list-style-type: none">• Static set point is used or sometimes reset based on outside air temperature
Chiller staging	<ul style="list-style-type: none">• Natural curve sequencing	<ul style="list-style-type: none">• Chillers are staged as close to full load as possible
Free cooling	<ul style="list-style-type: none">• 48-hour wet bulb weather forecasting is used to reliably trigger a free cooling transition	<ul style="list-style-type: none">• Whenever the outside air wet bulb temperature is less than 39 deg F

Pharmaceutical facility

- 250,000 sq. ft.
- First 11-months savings: saved 941,374 kWh of electricity

Medical Research Institute

- 210,000 sq. ft. labs facility
- First year savings: saved 2,400,00 kWh electricity

- Perform regular preventative maintenance
- Take advantage of low hanging fruit – VFD's
- Utilize a trusted vendor - Eversource can help
- Leverage available rebates through Eversource/Mass Save
- Make sure that results are measured to ensure long term performance

Thank you

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