



# Business Case for Natural Refrigerants

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June 12-14, 2018 – Long Beach



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## Refrigeration System EER

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June 12-14 Long Beach, Ca.

## Questions

1. How do utilities rebate natural refrigeration systems
2. How can a grocer understand and trust system efficiency claims
3. What should the industry have as a standard for efficiency of mechanical systems

## Answer

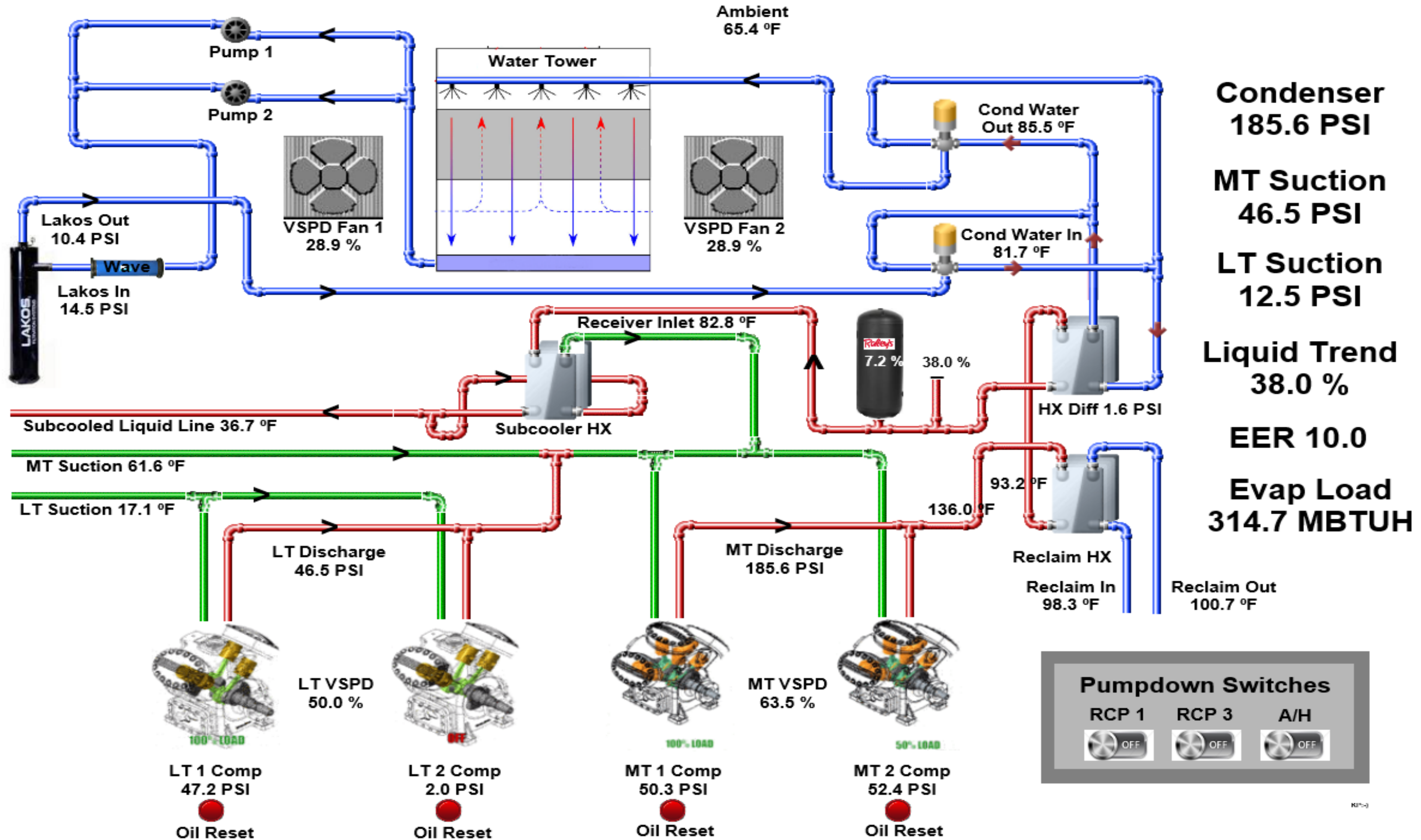
Measure BTU's transferred out of refrigeration system per watt purchased to operate compressors, condensers, AC system and auxiliary mechanical system components.

## History

1. We have used a full refrigerant flow plate heat exchanger for domestic hot water and space heating heat reclaim for 15 years
2. We moved to a plate heat exchanger for condensing in an attempt to reduce refrigerant charge.
3. We realized the three water circuits were rejecting 100% of system heat.
4. A simple formula of  $GPM \times 8.34 \times TD \times 60 = THR$  in BTUH
5. Apply factor for heat of compression and motor heat and you have evaporator load

## Components:

- A. An EMS tech who can write the formula in the controller
- B. Temperature sensors in wells on the “in” and “out” lines of the three water circuits
- C. Current transformers on Mechanical Distribution panel
- D. After start up, measure GPM of each circuit with Ultra Sonic meter or pressure drop across MPV/ Bal Valve

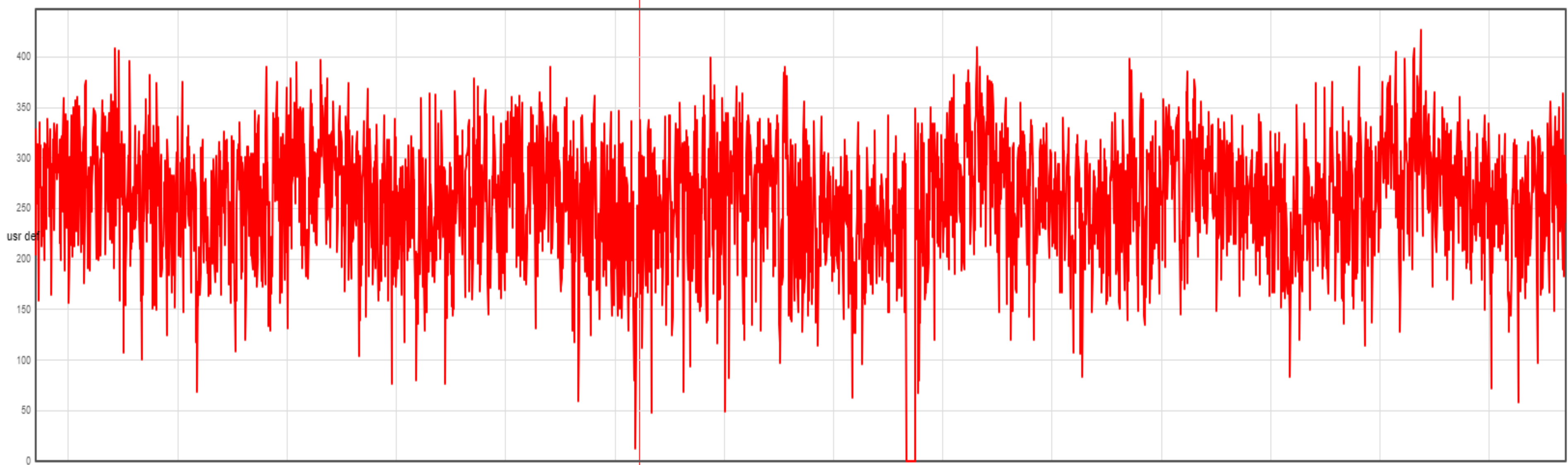


Show: 1 week of Logs in Site Time

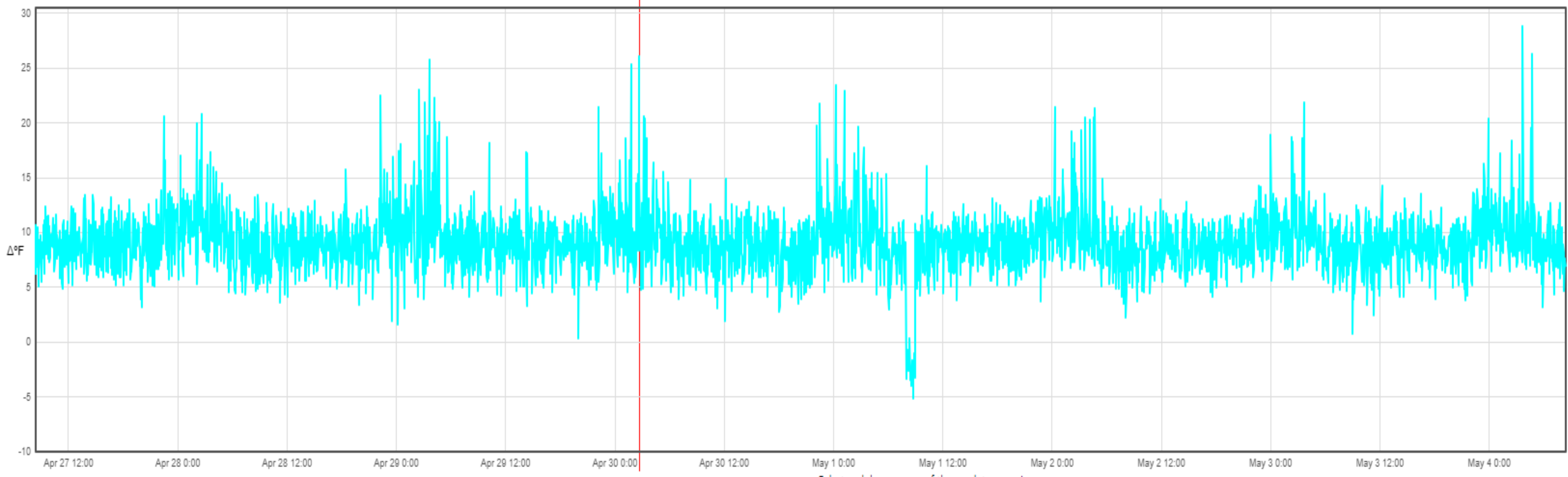
Refresh Logs Comprehensive

Show Expanded Legend

2018-04-30 02:38:45



Nob Hill #838/EVAP LOAD/AO1  
220 usr def



Nob Hill #838/EER CALC/AO4  
8.26 Δ°F

Select and drag an area of the graph to zoom in.

Show full path point list

## Data Uses

- A. Real time EER
- B. Real time evaporator load in BTU's
- C. Real time THR
- D. Measure amount of BTU's going to heat reclaim in real time
- E. Understand load fluctuations day, night, summer, winter, humidity, sales volume etc.
- F. How does ambient Wet Bulb effect load or EER
- G. Service ??





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sphere

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Thank you very much!

