

# Chilled Water Plants; Basic Principles, Ongoing Commissioning/Operation, and Optimization

Introduction



**Presented By:** 

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Senior Engineer

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1. Attendees will be able to discuss the different types of cooling equipment commonly found in central chilled water plants

2. Attendees will be able to discuss the different types of heat rejection equipment commonly found in central chilled water plants

3. Attendees will be able to discuss the different heat exchangers commonly found in central chilled water systems

4. Attendees will be able to discuss the role of pumps in central chilled water plants

5. Attendees will be able to discuss how the theoretical concepts presented in the class can be applied to real world systems

#### A Bit About You

- Let's go around the virtual room
- Each person tell us:
  - Your name
  - Your position
  - What you hope to gain from this cours

Turn on your video if you feel comfortable with that

I intended to be an aircraft maintenance engineer

How many of you are doing what you went to school to learn to do?



I intended to be an aircraft maintenance engineer

*I'm doing something totally different* 



I'm doing something <u>totally</u> different

HVAC field technician





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- Control system designer



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- FDE Senior Engineer



#### I've Had Great Mentors Along the Way



#### Bill Coad's Thoughts on Energy Conservation

- "... that is to practice our profession with an emphasis upon our responsibility to protect the long-range interests of the society we serve and, specifically, to incorporate the ethics of energy conservation and environmental preservation in everything we do."
- Energy Conservation is an Ethic
- ASHRAE Journal, vol. 42, no. 7, p. 16-21

PDF available at https://tinyurl.com/EnergyConservationEthic





#### My Most Important Lesson

• It's all about the load profile



#### My Most Important Lesson

• It's all about the load profile, both daily and seasonal









### A Few Resources



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https://av8rdas.wordpress.com X

Apps 100-Kathy's Calendar 100 OPB On-Line 00-Weather Airplages Building Benchmarks Copy Right Energy Financial Fit Bit Hawaii Trip Heart Heart Marks Wy Sites A Balog with a Field Perspective on Building Systems Other bookmarks H Write

#### A Field Perspective on Engineering

#### https://av8rdas.wordpress.com/

Engineering lessons from the field





#### Creating a Third Axis In Excel

Posted on April 19, 2019

One of the challenges that came up when I was creating the time series graph of a 9,000 ton chiller plant load profile that I show in my previous post was that I wanted to plot data series that had numbers in them with very large differences in the order of magnitude.



Click the Image to Visit Our Commissioning Resources Website



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http://www.av8rdas.com/

#### What's New?

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#### Buildings are Talking to Us

We Just Need to Learn How to Listen

#### My Goal

Welcome to A Field Perspective on Engineering's commissioning resource website. For those who don't know me from my blog or some other venue, I am a senior engineer for a company named Facility Dynamics Engineering a.k.a FDE, which specializes in commissioning, control system design, and some forensic engineering work.









# **Class Overview**

# Day 1

- Introductions
- Cooling Equipment
- Heat Rejection Equipment
- Coils and Heat Exchangers

# Day 2

- Pumps and Piping Systems
- kW per Ton Profile Concepts
- System Configurations
- Application Examples