



APPA Institute for Facilities Management

Energy & Utilities

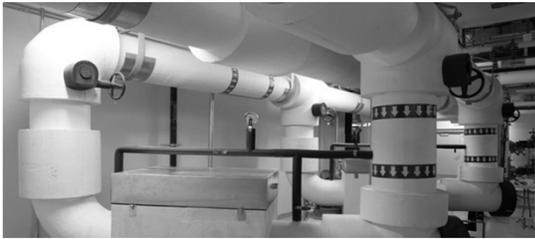
Cooling Distribution (317)

Mark St. Onge, EFP

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Purpose of Today's Presentation

To provide a broad understanding of
chilled water distribution systems



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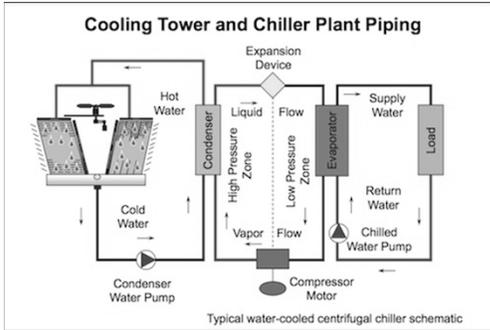
Agenda

Introduction to and examination of
chilled water distribution systems and
associated components



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Chilled Water System



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Chilled Water Distribution System

Components

- Pumps
- Pipes
- Expansion Tanks
- Heat Exchangers
- Controls
- Metering

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Chilled Water Distribution System

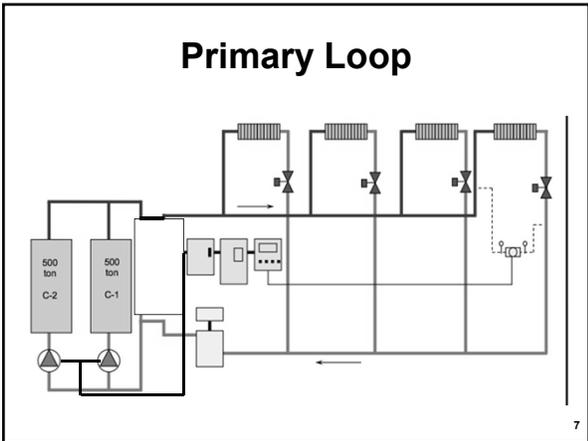
Designs

- Primary Loop
- Secondary Loop
- Tertiary Loop

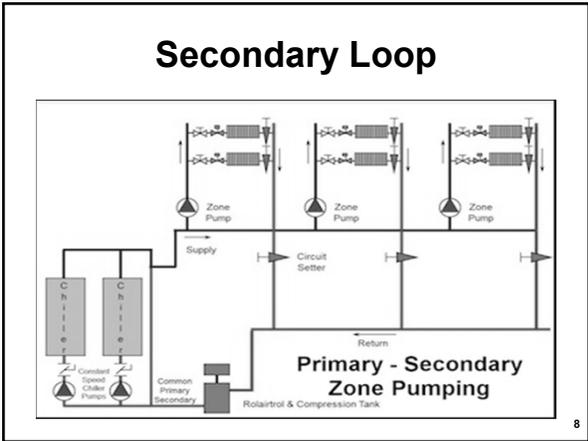
- Two Pipe / Four Pipe Systems

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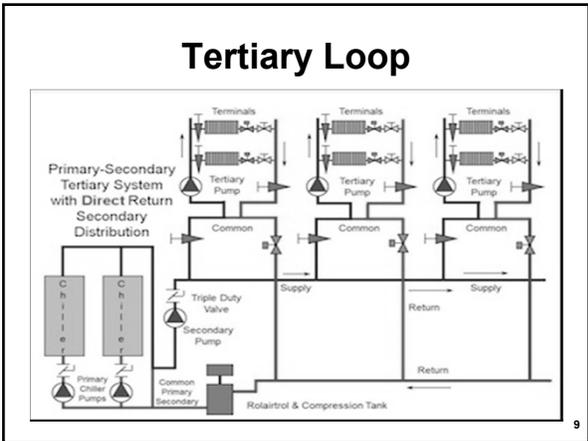
Primary Loop



Secondary Loop



Tertiary Loop

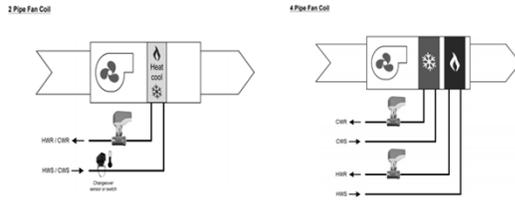


Plant Configuration

Why Primary / Secondary / Tertiary Pumping?

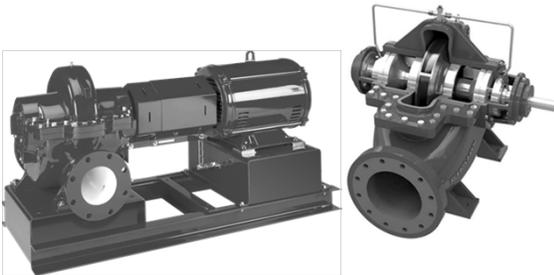
Save Pumps, Save Dollars, Save Energy
Go To: Variable Flow Direct Primary

Two Pipe & Four Pipe Systems



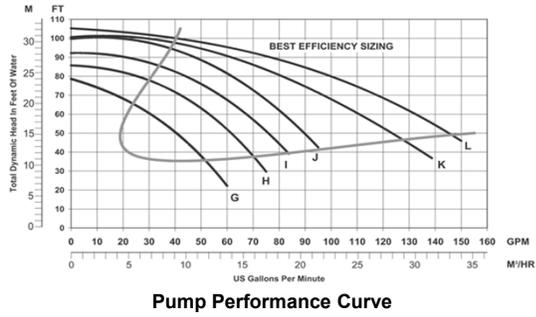
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Pumps



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Pump Performance



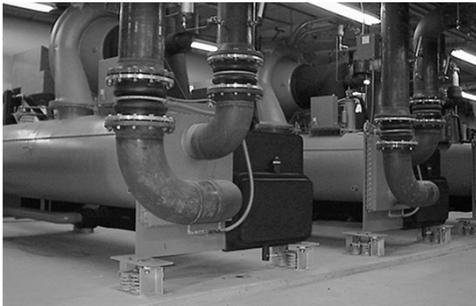
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Piping System



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Piping System Flexible Connectors



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Cross Connections



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Piping System Expansion Tanks



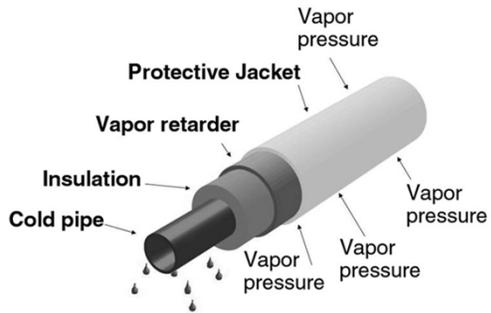
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Piping System Insulation



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Insulation



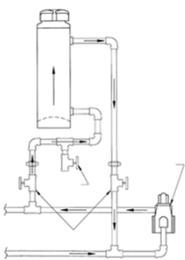
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Water Treatment



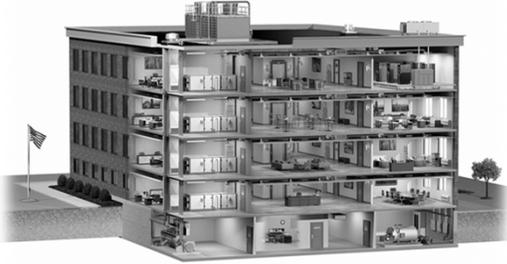
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By-Pass (chemical) Feeder



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Terminal Units



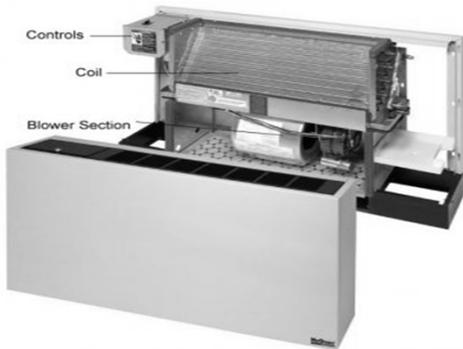
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Terminal Units



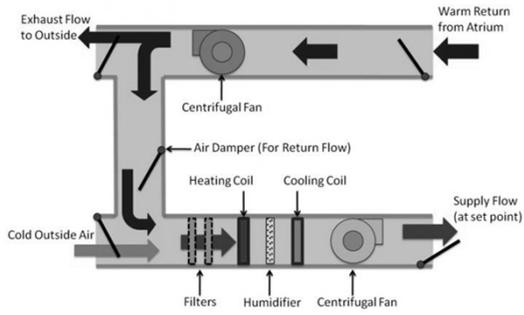
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Terminal Units



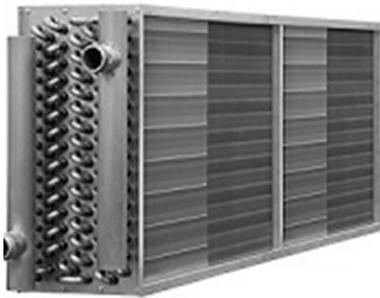
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Terminal Units



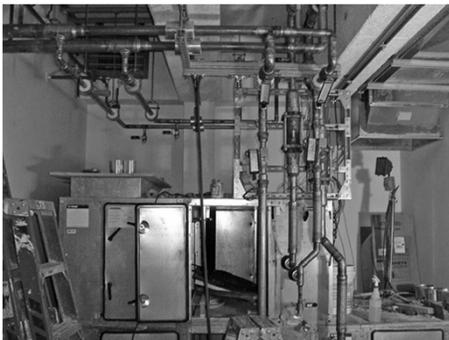
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Chilled Water Coils



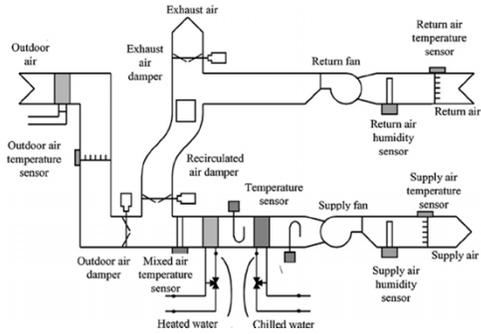
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Terminal Unit Piping



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Terminal Unit Controls



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Control Valves



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Filtration



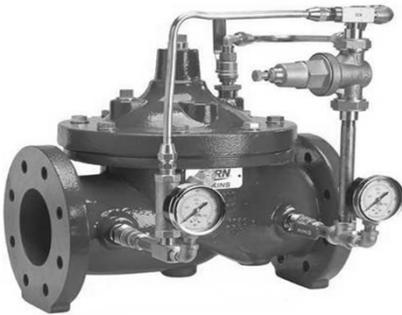
Water-side filtration



Air-side filtration

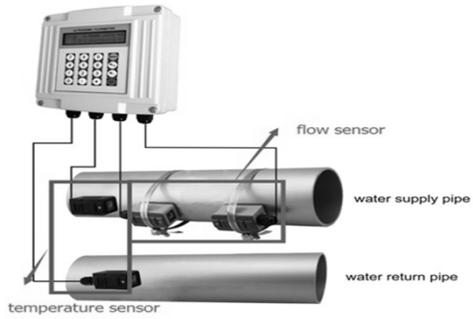
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Chilled Water System Make-up



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Metering

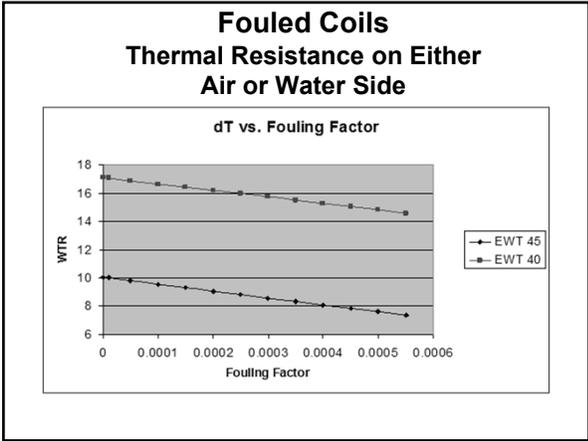


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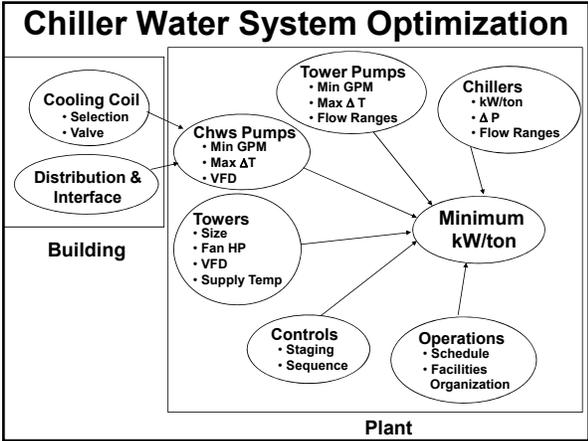
Building Performance

- Delta T
- Coils
- Valves

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- ### How to Maintain High DT
- Eliminate Mixing and Uncontrolled Loads
 - Maintain Design Deck Set Point
 - Solve Airside Problems on the Airside
 - Clean Coils
 - Minimize Plant DP
 - Locate and Eliminate Poorest Performers



Questions / Comments

Sign-in Sheet / Evaluation Form

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