District Cooling Systems

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District Cooling System

Introduction

Working

Chiller Plant & other System
Components

Benefits
DCS Components

- Central Chiller Plant—*Generate chilled water for cooling purposes*
- Distribution Network—*Distribute chilled water to buildings*
- User Station—*Interface with buildings' own air-conditioning circuits*
Chiller Plant & Auxiliary Equipment

- Chillers – Hi efficiency
- Pumping System
- Cooling towers
- Piping distribution
- Thermal Energy Storage
- Energy Transfer Station
- Controls
- Water treatment
**Chillers**

- Modules of high capacity Centrifugal Water Cooled Chillers are installed
- Chillers can be designed with series counter flow arrangement for various capacities of approx. 5000 TR
- Large delta T across Evaporators and Condensers
- Power consumption of approx 0.55 KW/TR
Pumps & Cooling Towers

- Fixed speed primary, condenser and variable speed secondary pumping
- Trend towards variable primary flow
- Power consumptions less than 0.2 KW/TR
- Chiller - Cooling Tower Optimization
- Select with the best approach
Piping distribution

- Capital intensive as it has to accommodate future expansion and should have longevity
- Good insulation properties
- Requirement of liaisoning with authorities for service corridor
- Welded steel, HDPE, Pre-insulated pipes commonly used.
- Use of leak detection system in buried pre-insulated pipe
Energy Transfer Stations - ETS

- Thermal energy transfer point between district cooling and customer's HVAC system
- Direct and indirect connection
- ETS comprises of heat exchanger and a set of control valves
- BTU Metering
**Controls**

- An industrial grade and reliable PLC based control system
- Complex and distributive in nature
- Unit Level are the field devices & DDCs
- System Level are the plant controllers
- Management Level with WS Software
Water Treatment

- To minimize deposition, corrosion and control of microbiological activity

- A qualified and experienced water service provider is often considered

- Chilled water network for initial fill and make up

- Condenser water network for initial fill and larger makeup

- Potable water, ground water, TSE, sea water

- Interest in using TSE water, but polishing plant needed for DC use
BENEFITS OF USING DISTRICT COOLING SYSTEMS

• Maximization of diversities
• Energy Efficiency
• Deferring Capital costs
• Increase in net lettable areas in buildings
• Reduction in O&M costs for the consumers
• Reduction in municipal utility infrastructure
• Minimization of environmental impact
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Thank You

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