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Kent Peterson, P.E., has worked as a consulting engineer for over twenty years and has a reputation for providing creative design solutions. He is the Chief Mechanical Engineer and a Principal of P2S Engineering in Long Beach, California. His design experience includes a wide range of projects including industrial, educational and high-tech manufacturing facilities.

Mr. Peterson is currently serving as an ASHRAE Vice-President. He has chaired numerous ASHRAE committees and is a past member of ASHRAE TC 1.2, Instruments and Measurements, TC 1.4, Control Theory and Application and GPC 13, Guideline for Specifying Direct Digital Control Systems. Mr. Peterson has authored a number of papers and articles.

LECTURE TOPICS:

Designing Central Chilled Water Systems

Engineers have many decisions to make when designing central chilled water systems today. Many of these decisions require extensive consideration of elements beyond the perimeter of the plant. Some of these questions include:

- What diversity factors can be used in sizing chilled water systems?
- How can the design delta T be achieved?
- What effect does delta T have on chiller performance?
- What plant configuration best fits the requirements?
- What control strategies should be used?
- How do you select the proper chillers, cooling towers and pumps?
- When is thermal storage viable?

Designing Cleanroom HVAC Systems

Cleanrooms are utilized in semiconductor, biotech and other industries to control product contamination during manufacturing. HVAC systems typically require air to be filtered to an acceptable level along with precise temperature, humidity and pressurization control. This presentation focuses on the fundamentals of cleanrooms, how to design HVAC systems for cleanrooms, trends in the industry and how to overcome these challenges while still providing an energy efficient system.

The Role of Controls for Acceptable IAQ

Controls play an important role in HVAC system compliance with ASHRAE Standard 62 “Ventilation for Acceptable Indoor Air Quality”. The selection and operation of ventilation controls for recirculation systems must consider many factors to be effective in maintaining air quality. These factors include the control of temperature, humidity, source contaminants and ventilation air. This presentation reviews the role of controls in providing system compliance with Standard 62.1 including:

- Control component selection and maintenance considerations
- The role of humidity control to minimize growth of allergenic or pathogenic organisms
- Ventilation Rate Procedure control functions
- CO₂ control techniques

Effectively Communicating Control Strategies in the Sequence of Operations

Many HVAC&R designs today lack an adequate Sequence of Operations. System designers are tasked with designing energy-efficient functional systems to meet a given design criteria. We select equipment components and assemble them into these functional systems. It is essential to document the intended system operation and interaction in the Sequence of Operations. Many decisions require a thorough understanding of elements controlled and their effect on other system parameters. This presentation will discuss how to effectively communicate system operational parameters for others to understand and provide a logical way for engineers to approach conveying the information.

Achieving Design Quality

Design quality provides the foundation for a successful project. High quality design and construction goes beyond technology and tools, requiring a high degree of knowledge, skill and judgment during all phases of the project. It requires communication, understanding, and the ability to balance clients' wants, needs, priorities and budgets. This lecture focuses on the steps designers should take to reduce potential for error throughout the production process; conceptualizing a design; system selection; and checking assumptions, calculations and conformance to owners' criteria and to applicable laws and standards.

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