Otomatica

DC Critical Cooling Systems

Training for Data Center Professionals

TRAINING CONTENT: DC Critical Cooling Systems (3 days)

Training Purpose

Mechanical cooling systems that contain the most important element of the Data Center Critical Physical Infrastructure are an important issue for both business continuity and data center efficiency. Reducing cooling power and water consumption without increasing risks for business continuity requires specialization. Mechanical systems are not easily analyzable and trackable like electrical systems. They are complicated and may inflict high losses in the enterprise receiving the services unless planned using the correct methods.

Various topics such as the diversity of mechanical systems, their various modes of operation, principles of heat transfer in various media, the diversity of thermal loads in data centers and the relationship between heat and humidity are making this discipline more difficult and creating barriers against professionals performing design, planning and operation.

The purpose of this training is to fill in any gaps in the knowledge of data center professionals, reinforce their existing knowledge, expand their holistic perspective and increase project and operation competence regarding data center mechanical cooling.

Understanding complex systems and structures is important for reliable capacity management, particularly for organizations that focus on “data center sustainable operation”. The know-how of the team will enable reducing human errors, tracking causal failures and increasing efficient operation capabilities.

Training Scope and Gains:

Information will be provided in the training on the methods to be followed to achieve significant gains including the following:

1. Basic physical rules,
2. Types of thermal loads,
3. Mechanical cooling systems and principles of operation,
4. Thermal behavior of air and its importance in systems,
5. White space air distribution methods,
6. Points to take into consideration in design, planning and operation,
7. Efficient operation models.

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Who Should Participate? The training was prepared for technical teams, data center technical managers, operation managers, project managers, specialists, consultants, design, project, planning

and operation engineers and specialist planning, project development and operation technicians who perform;

- Design,
- Project development,
- Planning Management,
- Operation Management,
- Capacity Management,

on the physical infrastructure of the current operating Data Center.

Training Program:

1. Fundamentals of Cooling and Thermodynamics
    a. Physical laws
    b. Psychometric diagram
    c. Cooling Cycle
    d. Basic cooling – Fans
    e. Principles of Free Cooling
2. Heat Discharge Methods and Systems
    a. Air-cooled Systems
    b. Water-cooled Systems
    c. Systems with Cooling Units
    d. Systems with Glycol
    e. Systems Based on Air Handling Units
    f. Difference Between Sensitive and Comfort Air Condition
3. Structuring White and Gray Spaces
    a. White Space Heat Loads
        i. Standard IT devices
        ii. Specific IT devices
        iii. Telecom devices
        iv. Cabins
        v. Other thermal loads
        vi. ASHRAE TC 9.9
    b. White Space Airflow Management
        i. Traditional Management
        ii. Heat Density Distribution
        iii. Management by Switching Off
        iv. CFD Analysis
        v. Airflow Management
    c. Gray Spaces
4. Air-Based Cooling Systems and Installations
    a. TIER Standard
        i. Tier IV and Sustainable Cooling
    b. Air-cooled Systems

i. Units and Installations
ii. Tier III and Tier IV structures
iii. Indoor and Outdoor Units
iv. Free Cooling Methods

c. Systems Based on Air Handling Units
i. Units and Installations
ii. Tier III and Tier IV structures
iii. Indoor and Outdoor Units
iv. Free Cooling Methods

5. Water-Based Cooling Systems and Installations
a. Water-cooled Systems
i. Units and Installations- Pumps
ii. Tier III and Tier IV structures
iii. Indoor and Outdoor Units
iv. Free Cooling Methods
b. Systems with Cooling Units
i. Units and Installations
ii. Tier III and Tier IV structures
iii. Indoor and Outdoor Units
iv. Free Cooling Methods

6. Efficient Operation Methods
a. Other Mechanical Systems
b. Capacity Management
c. Efficiency Management
d. Operation Management