

EU Terms #1 & 2

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Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

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Course Description

In these sessions, faculty will walk through various terms and definitions used in energy and utilities work. The focus of these sessions will be to put the terms into context and connecting pieces of systems together. Acronyms and jargon will be decoded.

Learning Objectives

- Learning Objective 1:
Discuss various terms and definitions used in energy and utilities.
- Learning Objective 2:
Learn how to put the terms into context.
- Learning Objective 3:
Learn to connect terms and definitions to the pieces of the systems.
- Learning Objective 4:
Learn to decode acronyms and jargon.

APPA Institute for Facilities Management - Energy and Utilities Terminology

AFDD (automated fault detection and diagnostics)	AFDD, or Automated Fault Detection and Diagnostics, is a growing family of technologies that are increasingly being adopted in many commercial building sectors. AFDD tools allow building operators to monitor various building systems closely, detecting and isolating operational errors and problems in real-time. It is estimated that 5%–30% of the energy used in commercial buildings is wasted due to faults and errors in the operation of the control system
Air Handler, Air handling Unit (AHU) Fan Coil	A device used to regulate and circulate air as part of a heating, ventilating, and air condition system
Backflow preventer, Double check valve, Vacuum breaker, Reverse pressure zone device (RP)	A device used to protect potable water from contamination due to backflow
BACnet and LonWorks	The two common Building Automation communication protocols
Boiler	A vessel used to covert water into steam
BTU	The British thermal unit (Btu or BTU) is a traditional unit of heat; it is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.
Building Management System (BMS)	A computer-based system that controls and monitors building mechanical and electrical equipment
Building Automation System (BAS)	
Chilled Water or Refrigerant	A medium commonly used to absorb the unwanted heat in an air handling unit's cooling coil
Chiller	A large piece of equipment that “makes” cold water used to cool and dehumidifier air
Co Gen vs Combined Heat and Power (CHP)	Cogeneration or combined heat and power (CHP) is the use of a heat engine or power station to generate electricity and useful heat at the same time.

Cooling Tower	A heat rejection device that uses water to transfer process waste heat into the atmosphere
Data Logger	A data logger is an electronic device that records data over time. Generally they are small, battery powered, portable, and equipped with a microprocessor, internal memory for data storage, and sensors. One of the primary benefits of using data loggers is the ability to automatically collect data on a 24-hour basis. Upon activation, data loggers are typically deployed and left unattended to measure and record information for the duration of the monitoring period. This allows for a comprehensive, accurate picture of the environmental conditions being monitored, such as air temperature and relative humidity.
DDC (Direct Digital Control)	Direct digital control (DDC) is a control process in which a microprocessor controller constantly updates an internal information database by monitoring information from a controlled environment and continuously produces corrective output commands in response to changing control conditions.
Delta T	A term frequently used to describe a difference in temperature between two measuring points
Demand	The maximum amount of electrical POWER that is being consumed at any given time
Feeder	Feeder is “voltage power line transferring power from a distribution substation to the distribution transformers.” In an electrical wiring circuit in a building a Feeder is a “wire/line that carries power from a transformer or switch gear to a distribution panel.”
Firewall	A piece of hardware or software that decides whether traffic coming into or going out of a server should be allowed
Freeze Stat	A temperature sensing device for HVAC that monitors a heat exchanger to prevent its coils from freezing
Gateway	A device that routes traffic between different networks
Glycol	Glycols are normally used for industrial HVAC, Process cooling/heating, and antifreeze. There are two main types of glycols, ethylene glycol and propylene glycol with propylene glycol available in industrial and food grades.
Grey Water vs Reclaim Water	Greywater (also spelled graywater, grey water and gray water) is all wastewater generated in households or office buildings from streams without fecal contamination, i.e. all streams except for the wastewater from toilets.
Heat Exchanger	A device used to transfer the thermal energy from steam to water

Hydronic	A cooling or heating system in which heat is transported using circulating water
IP Address	A numerical label assigned to each device connected to a computer network that uses the Internet Protocol for communication
Kilowatt	A standard unit of electrical POWER equal to 1,000 watts
Kilowatt hour (kW/h)	A measure of electrical ENERGY equal to 1,000 watts operating for 1 hour
Latent Heat	The additional heat required to transform 212° water into 212° steam
Latent Heat of Fusion	The heat absorbed when a substance changes phase from liquid to solid. For example, to reduce the temperature of 1 pound of water from 212°F to 32°F requires the removal of 180 BTUs (1 BTU for each degree of temperature change). To transform 32°F water into 32°F ice requires the removal of an additional 144 BTUs.
Latent Heat of Vaporization	The heat absorbed when a substance changes phase from liquid to gas. For example, to increase the temperature of 1 pound of water from 32°F to 212°F requires 180 BTUs (1 BTU for each degree of change). To transform 212°F water into 212°F steam requires an additional 970 BTUs.
Make-up	Water added to a system to compensate for loss by evaporation or leakage
Megawatt	A unit of Power equal to one million watts
MMBTU	The units MMBtu are used in the natural gas and other industries to indicate 1 million BTUs.
Network	This allows devices to be connected together so they can communicate
Pneumatic	A pneumatic control system uses compressed air as a medium of control for HVAC systems. Compressed air is carried via copper and plastic tubes from a controller to a control device, usually a damper or valve actuator.
Potable	Water that is considered safe to drink
Pressure Reducing Valve (PRV)	A control valve used to convert higher pressure distribution steam into lower pressure process steam

Radial Feed vs Loop Feed	In general electrical terms a radial feed is one line extending out, while a loop feed has two separate fully rated connection points. If a fault occurs on the radial feed there is no easy way to provide a back-up power source.
Reclaimed Water	The process of converting wastewater into water that can be reused for other purposes
Reverse Osmosis (RO)	A purification technology that forces water through semi-permeable membranes to remove impurities
Sensible Heat	The heat that can be felt or measured with a thermometer
Steam Trap	A steam trap is a device used to discharge condensates and non-condensable gases with a negligible consumption or loss of live steam. Most steam traps are nothing more than automatic valves. They open, close or modulate automatically. Steam traps are an important energy management device.
Substation	A set of equipment that reduces transmission voltage to voltage suitable for consumers
Supervisory Control and Data Acquisition (SCADA)	An industrial computer system that monitors and controls a process
Switchgear	A broad generic term for a variety of switching devices used to control and protect electrical equipment
Thermal Energy Storage (TES)	A system that reduces electrical demand by storing ice or chilled water during electrical off-peak periods for use during electrical on-peak periods
Ton Hours	The term of ton hours is used in conjunction with thermal storage. It usually relates to how many tons of cooling capacity you have available. For example a TES system with 20,000 ton-hours of storage could potentially dispatch 2,000 tons (of cooling) for 10 hours or 10,000 tons (of cooling) for 2 hours.
Tons (of cooling)	The unit ton is used in refrigeration and air conditioning to measure the rate of heat absorption. A ton is defined as the rate of heat transfer that results in the melting of 1 short ton (2,000 lb) of pure ice at 32 °F in 24 hours. A refrigeration ton is approximately equivalent to 12,000 BTU/h.

Two-Pipe System Four-Pipe Systems	vs	The four-pipe system includes a distribution system that contains both hot water supply with return lines and a chilled water supply with return lines. Two-pipe systems are less flexible than a four-pipe system. In a two-pipe system, the entire building is in either heating mode or cooling mode. The changeover from heating to cooling or vice versa is made manually, and there is always the possibility that unusual weather patterns might cause some occupant discomfort.
Variable Frequency Drive (VFD)		An electronic device used to control the speed of an electric motor
VAV (variable air volume)		Variable air volume (VAV) is a type of HVAC system. Unlike constant air volume (CAV) systems, which supply a constant airflow at a variable temperature, VAV systems vary the airflow at a constant temperature. VAV boxes typical us a "re-heat" coil to temper the air.
Virtual Private Network (VPN)		A connection method used to add security and privacy to private and public networks

This concludes The American
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