ENERGY to care H

Greater efficiency supports patient care.

Set Thermostats to Balance Efficiency and Comfort

All ECM content was independently developed and reviewed to be vendor, product and service provider-neutral.

Description

Increase baseline thermostat settings during summer months and decrease during winter months to balance energy efficiency and thermal comfort.

Project Talking Points

Both energy efficiency and thermal comfort goals are benefitted by modulating the baseline thermostat settings to align with seasonal and daily fluctuations in outdoor air temperature.

Benefits

- **Cost benefits**: Choosing appropriate temperature ranges and settings results in energy savings and cost savings.

- **Environmental benefits**: Reducing energy always reduces emissions and environmental impact.

- **Social benefits**: Depending on the improvements made, temperature controllability and thermal comfort should be improved, which enhances patient and staff experience. Cost savings can be used to fund the hospital's overall mission and to decrease health care costs.

Purchasing Considerations

- For facilities with partially building automation system (BAS) integrated systems, consider requirements for integration with the BAS, if desired. For example, pneumatic controls will require a converter.
- If BAS integration is not possible, consider thermostat guards to prevent unauthorized temperature changes.

How-To

For facilities without BAS integrated thermostats:

1. Understand your stakeholders and who is on the project team: facility manager, building engineer, BAS manager and building occupants.

2. Using the American National Standards Institute (ANSI)/American Society of Heating, Refrigerating and Air-Conditioning Engineering (ASHRAE) Standard 55: Thermal Environmental Conditions for Human Occupancy and ANSI/ASHRAE/American Society for Health Care Engineering (ASHE) Standard 170: Ventilation of Health Care Facilities, determine the upper and lower limits of thermal comfort in your facility, taking space function and type into account.

3. Implement the appropriate temperature settings for each zone/space.

4. Where possible, use thermostat guards to prevent unauthorized temperature changes.

5. If thermostat guards cannot be used, consider a monitoring plan to regularly check thermostat settings throughout your facility.

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3. Use BAS system to begin trending space conditions.
    - Trends provide critical feedback on space conditions and energy usage, making it easier to diagnose control problems and identify energy waste or changes in critical pressure.

4. Use monthly average temperature for your area and the results of the thermostat trends gathered through the BAS to develop a schedule for occupied and unoccupied hours. Once again, space function and type are important considerations for this process.

5. If possible, via the BAS, configure alarms to alert maintenance staff of spaces operating outside of their acceptable temperature range.

6. Via trending, monitor new default thermostat settings, and adjust as necessary.

7. Other thermostat considerations include:
    - Resetting the air handling unit (AHU) supply air temperature (SAT) to save energy while maintaining thermal comfort.
    - Thermostat lockout beyond a pre-set “dead-band” range (i.e. thermostat can only be manually adjusted between 68 to 72 degrees F).
    - Increasing temperature “dead-bands” in non-critical areas.
    - Resetting zone air supply, chilled water temperatures and heating water temperatures based on actual zone temperature feedback.

Case Studies

- **Bon Secours St. Francis Health System, Greenville, SC**

- Changing thermostat setpoints has helped reduce chiller usage and assure that HVAC systems do not simultaneously heat and cool spaces.

Resources

- ASHRAE
- Lawrence Berkeley National Laboratory: High Performance Healthcare Buildings: A Roadmap to Improved Energy Efficiency
- LEED for Existing Buildings: Operations + Maintenance
- LEED for Healthcare: New Construction and Major Renovations
  - Energy and Atmosphere Prerequisite: Fundamental Commissioning and Verification
  - Energy and Atmosphere Prerequisite: Minimum Energy Performance
  - Energy and Atmosphere Prerequisite: Building-Level Energy Metering
  - Energy and Atmosphere Credit: Optimize Energy Performance
  - Energy and Atmosphere Credit: Enhanced Commissioning
  - Energy and Atmosphere Credit: Advanced Energy Metering
- Pacific Northwest National Lab:
  - Building Retuning Training
  - Building Re-Tuning Training Guide: Occupancy Scheduling: Night and Weekend Temperature Setback and Supply Fan Cycling during Unoccupied Hours
- U.S. Department of Energy:
  - Energy Smart Hospitals: Retrofitting Existing Facilities
  - Hospitals Realize Fast Paybacks from Retrofits and O&M Solutions
  - Hospitals Save Energy and Money by Optimizing HVAC Performance
- U.S. Environmental Protection Agency (EPA): ENERGY STAR® Building Upgrade Manual

Regulations, Codes and Standards, Policies

- ASHE:
  - Health Facility Commissioning Guidelines
  - Health Facility Commissioning Handbook

- ASHRAE:
  - Standard 55: Thermal Environmental Conditions for Human Occupancy
  - Standard 62.1: Ventilation for Acceptable Indoor Air Quality
  - Standard 170: Ventilation of Health Care Facilities

ECM Synergies

- Establish baseline for current energy consumption.
- Retro-commission HVAC controls.
- Evaluate setback of temperature and airflow settings at night.
- Reevaluate HVAC equipment scheduling

ECM Descriptors

Category List:
- Controls

ECM Attributes:
- Optimize operations
- Repair or optimize existing systems

Improvement Type:
- Commission/retro-commission
- Retrofit/renovations
- New buildings
- Operations and maintenance (O&M)

Department:
- Engineering/facilities management