



Greater efficiency supports patient care.

MEDICAL OFFICE BUILDING UNOCCUPIED MODES

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

DESCRIPTION

Save energy and money without purchasing new equipment by implementing unoccupied modes in your Medical Office Building (MOB).

PROJECT TALKING POINTS

- As outpatient clinics, MOBs offer greater opportunities for implementing unoccupied modes than Inpatient Hospitals.
- Unoccupied settings can be implemented automatically via the Building Automation System (BAS), with local programmable thermostats, or manually via a planned operating schedule.
- For HVAC savings, increasing temperature deadbands, reducing airflow, cycling fans and adjusting your thermostat's temperature setpoints saves fan energy and reduces unnecessary operation, extending equipment life.
- Lighting can also be programmed using time of day controls and/or occupancy sensors for unoccupied times to reduce unnecessary operation.

TRIPLE BOTTOM LINE BENEFITS

Cost Benefits: Energy savings yield cost savings, and reduced equipment runtime avoids the cost of early replacement.

Environmental Benefits: Reducing energy consumption always reduces emissions and therefore environmental impact.

Societal Benefits: Unoccupied modes reduce energy costs, freeing up capital for patient care.

PURCHASING CONSIDERATIONS

- If your MOB does not have a BAS, consider installation/integration to enhance performance of this and other ECMs. If your facility cannot integrate a BAS at this time,

consider local controls and/or budget for/allocate staff time to manually implement setbacks as needed.

- If BAS controls are present, budget for controls vendor and BAS Manager time for this ECM.

HOW-TO

1. Establish a group of key stakeholders, including facility managers, mechanical engineers, facilities staff, floor supervisors, building automation system (BAS) vendor, and any external consultants.
2. If your facility has a BAS, ensure that trending capabilities are set up on the BAS. Trending enables before/after comparisons showing the project's progress. If there is no BAS at the MOB, check with the utility to see if interval data is available, or install a power monitoring system.
3. Identify unoccupied hours for the facility, both on evenings and weekends.
4. For evening unoccupied hours:
 - a. Make HVAC adjustments by season. If the MOB has a BAS, program these adjustments and trend results. If the facility does not have a BAS, manually schedule these adjustments at the thermostat (if programmable) or create a maintenance schedule.
 - i. In summer, increase the cooling setpoint by 5-10°F at the zone level.
 - ii. In winter, decrease the heating setpoint by 5-10°F at the zone level.
 - b. Make lighting system adjustments to minimize waste. Reduce operation to only essential security lighting. Ensure occupancy sensors are active to eliminate operation when spaces are unoccupied.
5. Follow the same protocol for weekends. If the facility is completely unoccupied on the weekends, consider a more aggressive strategy, such as immediately adjusting by 10°F.
6. During unoccupied periods, allow airflow to drop to a specific unoccupied minimum (or shut off completely). Typical practice allows units to "duty cycle" to maintain space temperatures when unoccupied. If the facility has a BAS, consider advanced occupancy control strategies such as optimal start/stop.
7. Set OA dampers to close when building is in unoccupied mode when allowed by code. Physically inspect to confirm desired operation. This lowers the risk of dampers freezing open.
8. During implementation, progress can be monitored via BAS. If setbacks seem to be working well, consider increasing the temperature setback further, especially on fully unoccupied weekends. If available, monitor space humidity either locally or via the BAS to ensure moisture does not become a problem.
9. It is not uncommon for the occupant needs of specific departments to be missed when establishing a building-wide schedule. Interview department managers before implementation and inform occupants of the changes being made and provide an avenue for feedback.
10. After implementation, measure and verify energy savings from unoccupied modes.
 - a. **If the facility has a BAS:** Monitor BAS trending for slipping performance at an interval that is reasonable for your staff (i.e. check every month, every three (3)

months, etc.). If desired, create alarms in the BAS system for unauthorized changes to the unoccupied mode schedule.

- b. **If the facility does not have a BAS:** Consider installing a power monitoring system or use utility interval data to monitor performance at an interval that is reasonable for your staff (i.e. check every month, every three (3) months, etc.). Include a setpoint check as part of your maintenance schedule.

REGULATIONS, CODES AND STANDARDS, POLICIES

ANSI/ ASHRAE Standard 55- [Thermal Environmental Conditions for Human Occupancy](#)

ANSI/ ASHRAE Standard 62.1-2019- [Ventilation for Acceptable Indoor Air Quality](#)

ANSI/ ASHRAE/ ASHE Standard 170-2017- [Ventilation of Healthcare Facilities](#)

ANSI/ ASHRAE/ ASHE Standard 189.3-2017- [Design, Construction, and Operation of Sustainable High-Performance Health Care Facilities](#)

ANSI/ ASHRAE/ IES Standard 90.1-2019- [Energy Standard for Buildings Except Low-Rise Residential Buildings](#)

CROSS REFERENCES

[LEED v4. For BD + C: Healthcare](#)

- Energy and Atmosphere
 - Prerequisite- Fundamental Commissioning and Verification
 - Prerequisite-Minimum Energy Performance
 - Prerequisite-Building-Level Energy Management
 - Credit- Enhanced Commissioning
 - Credit- Optimize Energy Performance
- Indoor Environmental Quality
 - Credit- Thermal Comfort

[LEED v4. For Operation & Maintenance: Existing Buildings](#)

- Energy and Atmosphere
 - Prerequisite- Energy Efficiency Best Management Practices
 - Prerequisite- Minimum Energy Performance
 - Prerequisite- Building-Level Energy Metering
 - Credit- Existing Building Commissioning- Analysis
 - Credit- Existing Building Commissioning- Implementation
 - Credit- Ongoing Commissioning
 - Credit- Optimize Energy Performance
 - Credit- Advanced Energy Metering

RESOURCES

Courses:

ASHRAE- Designing and Operating High-Performing Healthcare HVAC Systems (3 Hour Course)- <https://www.ashrae.org/professional-development/all-instructor-led-training/instructor-led-training-seminar-and-short-courses/designing-and-operating-high-performing-healthcare-hvac-systems>

ASHRAE- Healthcare Facilities: Best Practices for HVAC Design and Operation (6 Hour Course)- <https://www.ashrae.org/professional-development/all-instructor-led-training/instructor-led-training-seminar-and-short-courses/healthcare-facilities-best-practices-for-hvac-design-and-operation>

References:

HVAC Design Manual for Hospitals and Clinics, 2nd Edition- <https://www.ashrae.org/technical-resources/bookstore/health-care-facilities-resources>

Pacific Northwest National Laboratory, *Building Re-Tuning Training Guide: Occupancy Scheduling: Night and Weekend Temperature Setback and Supply Fan Cycling During Unoccupied Hours*- https://buildingretuning.pnnl.gov/documents/pnnl_sa_85194.pdf

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