



O&M *First!*

A product of the FEMP O&M Center of Excellence

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Tutorial: Five O&M Ideas on How to Save Money in Your Buildings NOW!



The U.S. Department of Energy's Federal Energy Management Program (FEMP) is pleased to present the series O&M First! as a way to promote energy efficiency by first applying O&M best practices. It is our hope that the experiences shared will provide Federal facility managers with strategies they can apply to their own facilities, as well as introduce the FEMP O&M program to federal site staff.

A copy of the FEMP O&M Best Practices Guide can be downloaded at www.eere.energy.gov/femp/operations_maintenance/om_best_practices_guidebook.cfm. This Guide, which covers a full range of facilities O&M topics, provides the rationale for a proactive O&M program; identifies O&M management issues and their importance; explains the various O&M program approaches; introduces maintenance technologies; and explores O&M procedures for the predominant equipment found at most federal sites.



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O&M experts agree that building owners and operators can significantly reduce costs by improving their O&M practices. In fact, most O&M auditors claim a minimum 5–10% efficiency improvement is achievable in virtually any building by implementing certain low- and no-cost measures. The key is knowing where to look. This FEMP O&M tutorial calls out some of the most likely opportunities for your buildings. Available opportunities and savings will vary by site.

Opportunity 1: Fully utilize control system capabilities

Energy management and control systems (EMCS) have been installed at many federal sites. These systems provide centralized control (scheduling, settings, alarms, and monitoring) of building HVAC and lighting systems. However, system administrators and operators must be fully versed in system capabilities and operations in order to fully utilize the EMCS and realize the predicted and budgeted energy-efficiency improvements. *Solution:* First, make sure EMCS system documentation (e.g., as-built drawings and training/O&M manuals) is provided at your installation and is maintained thereafter. This documentation should provide information on the system's installed capabilities and potential for future connections. Second, when a new system is installed and when new operators are assigned, make sure system operator training is provided, along with periodic refresher training over the life of the system. Third, periodically review the installed and available capabilities to ensure proper operation, and identify new capabilities that can enhance building operations.

Opportunity 2: Correct system overrides

Facility staff may override automatic controls for a number of reasons—the occupants need to work extra during off-hours (e.g., late nights, weekends, holidays), occupants complain about space temperatures, or system operator corrections for a variety of reasons such as extreme weather. But system overrides are frequently left in place, sometimes inadvertently—sometimes not, leading to inefficient system operation, energy losses, and additional equipment wear and tear. *Solution:* Periodically and systematically review equipment operating parameters, verify system settings and operations, and make corrections as appropriate. Also evaluate and correct the underlying problems that create the need to override controls.

Opportunity 3: Adjust reset temperatures and temperature settings

Settings are sometimes adjusted over time based on personal preferences or to compensate for inadequate system operation. Settings may also be adjusted in an effort to attain energy efficiency improvements. *Solution:* Periodically and systematically calibrate sensors, review settings, and make necessary adjustments.

Opportunity 4: Control time of use

Operate systems only as needed. Do motors, pumps, fans and air handlers really need to operate 24/7 to maintain conditions required by building tenants and the building operating plan? In many cases equipment operating hours can be reduced. *Solution:* Evaluate the real needs for equipment operation over the course of the day. Set system controls accordingly. Install system start/stop controls if necessary. Consider new on/off control strategies such as optimum start/stop that can more effectively control building equipment energy use. Enable holiday scheduling capability to turn-off or reduce service levels of HVAC systems during scheduled holiday building closures.



Sometimes short-term fixes are needed, but effective O&M requires long-term solutions that help ensure proper operation.

Opportunity 5: Repair dampers and economizers

Malfunctioning or poorly tuned dampers (including seals, actuators, and linkages) and economizers result in 1) increased energy use and costs (e.g., increase supply air fan energy in closed position or require additional air heating or cooling when open too much), 2) undesired building operating conditions due to lack of outside air, and 3) premature equipment degradation and replacement. *Solution:* Verify damper operations and positions. Add these checks to your Standard Operating Procedures/PM program to help ensure that equipment operates correctly.

Additional opportunities

There are many more opportunities available that will cost-effectively improve building operations and save energy and money. Examples include

- staging/sequencing of boilers, chillers, and air-handling units
- eliminating simultaneous heating and cooling
- proper controls applications
- sensor calibration and application
- load management.

Continuous attention to these types of issues is a critical component to an effective O&M program as presented in the FEMP Operations & Maintenance Best Practices Guide.

Leading by example, saving energy and taxpayer dollars in federal facilities



FEMP O&M Resources

FEMP is committed to providing federal facility staff tools and knowledge to help optimize their O&M programs. Visit the FEMP homepage for information on O&M and other FEMP programs and activities at www.eere.energy.gov/femp.

FEMP also offers the workshop Operations and Maintenance Management. To find out more about this course, visit www.eere.energy.gov/femp/services/training_om.cfm.

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