
Training: The Overlooked Opportunity for O&M Savings

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Topics

- **The O&M team**
- **Operator training improves building performance**
- **Training resources for operators**
- **FEMP partnership with BOC™**



Terms

- **Maintenance = Capacity**
 - ◆ *Caring, cleaning, lubing, repairing*
- **Operation = Performance**
 - ◆ *Scheduling, implementing efficient control strategies, sequencing of equipment*



O&M Team

Director of Operation & Maintenance

- **Maintenance**
 - ◆ *PM, Service Orders, Elevators, Custodial*
- **Shop**
 - ◆ *Sheet Metal, Plumbing, Steam Fitting, Carpentry*
- **Operations**
 - ◆ *Building automation system, equipment operation, night crew, water testing*



Terms

Building Operator

- ◆ *Responsibilities: Maintain and operate equipment for occupant comfort and satisfaction*
- ◆ *Staffing: 1 FTE/125K sf*
- ◆ *Titles: HVAC Technician, Electrician, Building Engineer, Maintenance Engineer, and more...*

What does this tell us about impact on building performance?



Energy Management

- 1. Purchase reliable energy at the lowest cost**
- 2. Replace old (less efficient) equipment with new EE technologies**
- 3. Operate energy consuming systems efficiently**



Trained Operators

- **Reduce utility costs by 15-20%**
 - ◆ *Review of 30 studies of O&M improvements (PECI, 1995)*
 - ◆ *Pacific NW National Lab improved building efficiency by 25-47%*
 - ◆ *Fred Hutchinson Cancer Research Center saves \$150,000 annually by re-setting lighting controls and temp set points*



Trained Operators*

- **30% more likely to engage energy efficiency practices**
- **25-50% more likely to participate in utility energy efficiency programs**

*Source: Northwest Energy Efficiency Alliance, 2001



Trained Operators

- **16 efficiency practices**
 - ◆ *Optimizing operations and PM*
 - ◆ *Reading meters and reviewing utility bills*
 - ◆ *Organizational efficiency decisions*



Energy Efficiency Impacts

- ◆ *Electricity* *0.5 kWh/sf*
- ◆ *Gas* *1.95 MMBtu/1000 sf*
- ◆ *Water* *0.62 gals/sf*

\$10-20K annually per facility



Training Needs

- ***“Training is one of the greatest weaknesses of the present maintenance structure in the U.S.”*** (AFE, FO&E Reference)
- ***“The skills I really needed were in electronics with some basic computer skills, not just steam fitting, sheet metal, and plumbing.”*** (Cotts, The FM Handbook)



Training Program

- **Budget: \$1K to \$1.5K annually per operator**
- **Training Levels:**
 - ◆ ***Craft Training***
 - ◆ ***Journeyman Training***
 - ◆ ***Cross-Training***
 - ◆ ***Planner Training***
 - ◆ ***Supervisor Training***



Training Resources

- **For managers**
 - ◆ *BOMI's Facility Management Admin (FMA)*
 - ◆ *AFE's Certified Plant Engineer (CFE)*
 - ◆ *IFMA's Certified Facility Manager (CFM)*
 - ◆ *AEE's Certified Energy Manager (CEM)*
- **For operators**
 - ◆ *BOMI's System Maintenance Admin (SMA)*
 - ◆ *Building Operator Certification (BOC)*
 - ◆ *Operating Engineers Union (IUOE)*

What others are you aware of?



What is BOC?

- **BOC™ credential**
 - ◆ *Operator recognition*
 - ◆ *Employer can identify skilled operators*
- **Course of study in energy efficient building practices**
 - ◆ *Building systems overview, HVAC, Electrical, IAQ, Energy management (56 hours)*
 - ◆ *Testing & facility project assignments*



Ft. Lewis Army Base



- 22 million sf
- 1,000 buildings
- 20 staff in BOC
- Mechanical, Electrical, Plumbing



Ft. Lewis Results

CHALLENGES

- Older, inefficient facilities
- Increasing efficiency above ASHRAE
- Lack of integrated controls system



Ft. Lewis Results



RESULTS

- Culture change
- Improved IAQ
- Efficiency in pre-construction
- Enhanced perception



Summary

- **Building operator responsibilities emphasize “O” in O&M**
- **Operator training improves performance**
- **Trained operators can enhance Cx projects**



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