Building Operator Certification in NYC

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About BOC

• National program - NEEC
  – Regional providers + utility partners
  – ANSI-IACET accreditation
  – 135 hours of training (levels 1 + 2)
  – Project work in home facility
  – Maintenance of Certification (CEU)

• CUNY-BPL - “Authorized Provider” for NYC
  – Institutional training partners
  – 15 - 30 weeks
  – NYSERDA support
Industry Trends

• Measured performance with rankings and labels
• New technologies – performance assurance
• Systems Thinking – moving Operations beyond component repair and complaint response

Understand what competencies are being sought
Mechanism for action

- **Preparing the Operator to be "in the loop"**
  - Feedback in On-going Cx and RCx
  - Getting the data
  - Appreciating the data

- Operating Engineers are a unique breed
  - Intuitive, not highly quantitative
  - Hands-on approach, get things done
Transformative Goal

Operators’ New Mission

Instilling efficacy, not preaching

Greening the grizzly skeptic
Logic Model & Improvement Process

OPERATOR COGNITION

Knowledge-Skills-Abilities

motivators

OPERATOR BEHAVIORS

BUILDING OUTCOMES

Interpretive Skills

TRAINING
Instructional Design based on Skill Sets for -

• Understanding Energy & IAQ dimensions of system operations

• Documenting systems, conditions, operations

• Using energy and other data for measuring and interpreting of performance

• Working quantitatively, visualizing data

• Identifying and describing improvement opportunities, working in organizational teams
Pedagogy

- **Science concepts**
  - Physics-based processes

- **Quantification**
  - Units of measure & measurement tools
  - Use of formulae, calculations, spreadsheets

- **Practical Projects**
  - Schematics
  - Controls
  - Energy Data
  - Improvements

**Learning-By-Doing**
Structure DOING

• *Observation*  Observe and DRAW Building Systems
• *Data*  Energy data feedback from benchmarking data
• *PROJECTS*  Plan improvements
Project-based learning

Initial

schematics of building systems
  • Mechanical
  • Electrical

Second level

introduce energy data.
  • ESPM
  • dashboard
  • Lab learning.

Conclusion

identify and characterize improvement project
Structuring Observation, Encouraging DOING in home facilities
Use data in projects

Teaching Tools - 2
What students have to do: energy use histories

2 tables:
- Use by type
- End-use allocation

Teaching Tools - 3
What students have to do: Project Characterization

Spreadsheets
Support

Comparison

Conditions

Actions

Outcomes

- Graphic data plots
- Peer groups
- Event recording

Creating a user-friendly data interface with IBM Research "Smarter Planet" program
Transformation

It takes TIME

- 30 week experience
- Progressive development of skills, thought-processes
Long-term On-going Process

• Communities of Practice
  – Social media
  – Events
    • maintenance of certification “fair”
• Evaluation
  – longitudinal research
Directions

• On-line “blended” learning
• Coordination with other organizational levels
• Specialized offerings
  • Retro-commissioning & Re-tuning
  • High-tech facilities
  • Controls, Controls, Controls
Thank you for your attention.
Let’s Work Together.

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