Agenda

- Recommissioning Overview
- Good Candidates for Recommissioning
- Poor Candidates for Recommissioning
- Cost of Recommissioning
- Benefits of Recommissioning
- Utility Rebate Programs
Recommissioning Overview

Also Known As...

- Existing Building Commissioning
- Retro-Commissioning
- Continuous Commissioning
Recommissioning Overview

- Process can Begin Anytime after the Original Design and Construction Team are off the Job
  - One day later
  - One year later
  - Many years later
Recommissioning Overview

Recommissioning is:

- A process by which existing facility system performance is evaluated against the owner’s needs and adjusted and optimized to meet the functional performance criteria.

- A process that focuses on DYNAMIC system operation instead of STATIC equipment installation.
Recommissioning Overview

Recommissioning is Not (but could include):

- Energy audit
- Facility condition assessment
Recommissioning Overview

Recommissioning is Verifying Systems Perform as Effectively as Desired

- Environmental controls
- Life safety systems
- Lighting
- Electrical power
- Energy management
Recommissioning Overview

Recommissioning is Verifying Systems Perform as Efficiently as Possible

- Minimizing run times
- Adjusting set points
- Controlling outside air ventilation
- Optimizing equipment staging
- Sensor calibration
- Valve & damper performance
- Etc.
Recommissioning Overview

Operational Criteria Documentation

Information Gathering
  • Documentation reviews
  • Interviews
  • Field observation

Dynamic System Testing & Monitoring

Report & Recommendations
  • Gap analysis
  • Fine tuning
  • Capital projects

Implementation

Measurement & Verification
Good Candidates for Recommissioning

- High Energy Use Buildings
  - Energy Star score
  - Comparison to previous years
  - Comparison to other buildings on campus
  - Comparison to other buildings in portfolio
Good Candidates for Recommissioning

- Buildings with “Problem” Systems
  - Temperature control issues
  - Indoor air quality
  - Building pressurization
  - Frequent equipment failures
  - Etc.
Good Candidates for Recommissioning

- **Highly Used Buildings**
  - 24/7 operation
  - 2-3 shifts of production
  - Lots of on-time with varying demand
  - Etc.
Good Candidates for Recommissioning

- Air Conditioned Facilities
- Older Buildings with Multiple Renovations
- New Un-Commissioned Buildings
Good Candidates for Recommissioning

- Facilities with Minimal On-Site Operations & Maintenance Personnel
Poor Candidates for Recommissioning

- Buildings with Out-Dated or End-of-Life Equipment
  - Moving parts don’t move
  - Leaky valves and dampers
  - Unhealthy conditions
  - Etc.

![Poor equipment example]
Poor Candidates for Recommissioning

- Buildings with Major Design Problems
  - Insufficient capacities for current loads
  - Missing components required for meeting operational criteria
Poor Candidates for recommissioning

- Buildings with Major Equipment Failures
  - Fans
  - Pumps
  - Boilers
  - Chillers
  - Dampers
  - Control systems
Cost of Recommissioning

Cost Influences

- Quantity & complexity of systems
- Expertise & involvement of O&M staff
- Documentation availability
- Computer-based vs. local controls
- Duration of the Recommissioning process
## Cost of Recommissioning

<table>
<thead>
<tr>
<th></th>
<th>Cost per Sq. Ft.</th>
<th>Energy Savings</th>
<th>SPB in years</th>
<th>Non-Energy Benefits (per Sq.Ft.)</th>
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</thead>
<tbody>
<tr>
<td>Existing Buildings</td>
<td>$0.27</td>
<td>15% of whole building energy</td>
<td>0.07</td>
<td>$0.18</td>
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</tbody>
</table>

## Cost of Recommissioning

<table>
<thead>
<tr>
<th>Project Type</th>
<th>Size (1,000 sq ft)</th>
<th>Cost ($/sq ft)</th>
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<tbody>
<tr>
<td>Laboratory</td>
<td>10</td>
<td>1.00</td>
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<tr>
<td>Office</td>
<td>20</td>
<td>0.25</td>
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<tr>
<td>Laboratory</td>
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<td>2.50</td>
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<tr>
<td>Office</td>
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<td>Office</td>
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<tr>
<td>Office with TES</td>
<td>160</td>
<td>1.25</td>
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<tr>
<td>Multi-Building</td>
<td>360</td>
<td>0.17</td>
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<tr>
<td>Office</td>
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<td>0.10</td>
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<tr>
<td>Office</td>
<td>400</td>
<td>0.19</td>
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## Cost of Recommissioning

<table>
<thead>
<tr>
<th>Building</th>
<th>Cost</th>
<th>Savings/Year</th>
<th>Payback (Years)</th>
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<tbody>
<tr>
<td>Highrise Office</td>
<td>$12,745</td>
<td>$8,145</td>
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<tr>
<td>Medical Facility</td>
<td>$24,000</td>
<td>$63,502</td>
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<tr>
<td>Computer/Office</td>
<td>$28,000</td>
<td>$30,385</td>
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<tr>
<td>Retail</td>
<td>$52,336</td>
<td>$42,500</td>
<td>1.2</td>
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</tbody>
</table>

E-source study of 44 building ranging from 80,000 to 887,000 sq ft. Includes investigation, report, and implementation costs.
Benefits of Recommissioning

- Optimized System Operation
  - Proper system operation
  - Energy conservation
- Systems Documentation & Training
- Sustained Efficient Operation
Utility Rebate Programs

- Electric Utilities
- CenterPoint Energy
  - Recommissioning studies
  - Energy savings measures implementation
  - Collaborate with electric utility programs
  - Contact your CenterPoint Energy account manager for more details
Discussion