Commissioning for Existing Buildings for Hospitals

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Agenda - Commissioning for Existing Buildings

• Introductions

• Why retrocommissioning?

• Duke Energy’s “Commissioning for Existing Buildings” value proposition

• Hospital’s benefits and responsibilities

• Project process

• Questions / Next Steps
Why Retrocommissioning?

Retrocommissioning is a systematic process to ensure that building systems perform according to original building plans, specifications, the design intent, and the owner’s operational needs. LEED points available for Retrocommissioning of existing buildings and it can assist with achieving ENERGY STAR certification.

Do any of these describe your building(s)?

- Never commissioned properly
- Not operated correctly over time
- Owner’s operating requirements have changed
  - Occupancy
  - Addition/subtraction of spaces
  - Different space types
- Design standards have changed
Why Retrocommissioning?

Duke Energy’s goal is to produce total building energy savings of 10%-15% by understanding how your building and equipment use energy.

Typical customer goals are:

- Reduce demand & energy consumption
- Reduce time of staff responding to complaints
- Increase equipment life
- Improve occupant comfort, safety & ultimately satisfaction

ASHE Health Facility Commissioning Guidelines

• Commissioning is critical to the success of every healthcare facility project.
• ASHE’s guide is a standard process for cost-effectively commissioning healthcare facilities.
• Includes retro-commissioning tactics
• Duke Energy Program: Commissioning for Existing Buildings

Using a holistic building approach, energy savings will typically come from the areas of greatest energy consumption.

**Office Buildings – Areas of typical energy consumption**

- **HVAC - Related Energy Efficiency Deficiencies**
  - Air handling & distribution (37%)
  - Cooling Plant (11%)
  - Heating Plant (6%)
  - Terminal Units (4%)
  - HVAC (combined heating and cooling) (4%)

- **Lighting - Energy Efficiency Deficiencies (3.6%)**

- **Facility wide Energy Efficiency Deficiencies**
  - Energy Management System or utility related (3%)
  - Envelope (1%)
  - Plug Loads (1%)
  - Other (30%)

Non-Energy Impacts of Retrocommissioning

Non-energy impacts provide the owner with additional reasons to conduct Retrocommissioning and value.

Reported by Evans Mills, LBNL in HPAC Oct 2005
Commissioning for Existing Buildings

Duke Energy’s Commissioning for Existing Buildings Value Proposition

RCx Agent
- Authorized and licensed
- Deep experience
- Master List of Findings
- Retrocommissioning Implementation Plan

Financial Support
- Smart $aver Incentives (Duke)
- Shared expenses for RCx Agent

Technical Support
- Benchmark energy consumption
- On-site Assessment
  - Identify top EE capital retrofits
  - Measurement & Verification
Four Phases of the Retrocommissioning Process

Phases 1 to 4

**Ph. 1 - Planning**
- Initial Site Visit
- Develop high level Energy Conservation Measures
- Develop RCx Plan of Work

**Ph. 2 - Investigation**
- Functional Testing
- Develop detailed Energy Conservation Measures
- RCx Report & Recommendations

**Ph. 3 - Project Organization**
- Apply for Duke’s Smart $aver Incentives
- Identify capital investments

**Ph. 4 – Implementation**
- Contract with customer to manage service org.
- Phased approach of ECMs to fit budget
- Low-cost/No cost ECM
- Capital Improvements
- Operator Training
- Measurement & Verification
Ideal Customer Candidate

Experience tells us that you will get the greatest value from retrocommissioning if your building fits this description...

- Pursuing ENERGY STAR or LEED certification
- Budget allocated to EE in next 12-18 months
- Hurdle rate is approx. 3 years

ISSUES
- thermal comfort
- indoor air quality
- labor cost pressure
- older equipment
- warranties expiring
Example of EE Savings & Funding to Medium-Sized Hospital

<table>
<thead>
<tr>
<th>Duke Energy</th>
<th>Hospital</th>
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| • Incentive: $49,250  
  • Assessment Cost: 50% | • Total Estimated Annual Electric Savings: $41,080*  
  • Assessment Cost: 50% |

Year 1: Net Savings to Hospital: $90,330  
Years 2 - 5: Energy Savings to Hospital: $180,751 (NPV)

*Rule of Thumb: Duke Energy’s Custom Incentive is roughly equivalent to one year’s electric energy savings or it brings down simple payback by one year.
Here’s what you will need to bring and what we will provide.

- Select building of approximately 100,000 SF for RCx work
- Complete RCx Program Application
- If required: Opt-in building under SAW to get Incentives
- Commit 40-60 hours of senior facility staff
- Pay 50% of Level I Assessment:
  > Day 1 = $6,000
  > Days 2-3 = $1200 each
- Pay 50% of SOW for RCx Study & Plan:
  > Amount determined by ECM selection
- Pay 50% of Level I Assessment:
  > Day 1 = $6,000
  > Days 2-3 = $1200 each
- Pay 50% of SOW for RCx Study & Plan (not to exceed $20,000): Amount determined by ECM selection
- Provide Smart $aver Custom Incentive for upgrades & retrofits.
Customer Benefits

Program Participants Receive the following:

• Reductions in energy spending:
  – Near term less than 1 year paybacks
  – Longer term paybacks of 2 - 3 years

• Assistance with achieving measurable sustainability improvements:
  – Duke Energy will provide a qualified Retrocommissioning agent, pay up to 50% of the fee, and recommend an action plan
  – Eligible customers may receive financial incentives:
    • Near term work: little or no cost; part of RCx agent’s fee
    • Longer term work: through Duke Energy’s prescriptive and custom rebates for project installations
  – Duke Energy will work closely with customers to provide project design and installation assistance including:
    • RCx Agent recommendations
    • Design and submittal reviews
    • Project management
    • Performance measurement and verification

Program participants will need to:

• Fund capital investments for energy savings beyond the basic RCx work
• Agree to work closely with Duke on implementing and validating this program
• Be able to develop projects within the program schedule
Customer Responsibilities

Program Participants Responsibilities:

• Select Buildings
  – Commercial Buildings, Colleges/Schools, Hospitals
  – > 100,000 sq. ft.

• Assistance with achieving measurable sustainability improvements:
  – Provide drawings of building mechanical, electrical, and control systems
  – Provide access to building automation systems and controls

• Fund capital investments for energy savings

• Agree to work closely with Duke on implementing and validating this program

• Be able to develop projects within the program schedule
Next Steps

1. Initial Customer Meeting
   • Program overview
   • Provide evaluation information
   • Expression of interest

2. Program Application
   – Complete Duke Energy’s program application

3. Assemble Team – On-Site Meeting
   • Meet with Duke Energy and partnering RCx firm
   • One or more members of customer’s facilities staff including building manager and building maintenance supervisor/maintenance provider
   • Discuss building energy use and any operational problems (e.g. always cold on north side of floor)
   • Walk through site and quick review of available drawings, specifications, control information and BAS

4. Retrocommissioning Process
   • Review operations in detail and gather information
   • Develop functional performance tests for select equipment on your site
   • Functional performance testing
   • Implement select no-cost/low-cost adjustments or modifications
   • Identify and report recommended energy conservation measures
   • Review with team - Duke Energy, RCx Agent, Building owner representative, building management
   • Rank order ECMs
   • Define Scope of Work for specified ECM investigation

5. Implementation Phase for Capital Energy Improvements
Timeline

- Kick-Off Meeting (on-site)
- Retrocommissioning Process
  - Walkthrough - within one month of initial meeting
  - Develop Functional Performance Tests - month 2
  - Test equipment and identify Energy Conservation Measures – month 3
  - Review test results and ECMs with owner/manager and team - month 4
  - Determine Duke Energy Smart $aver Incentives Available - month 5
  - Complete FPT for seasonal equipment (summer/winter) – month 6
  - Final report – month 6-7
- Energy Savings Process
  - Identify capital measures and make decisions on low-cost/no-cost ECMs – month 6
  - Implement low-cost/no-cost ECMs – month 7-9
  - Fund capital ECMs
  - Design capital ECMs (if required) – month 9-12
  - Install capital ECMs – by end of year 2
  - Commission capital ECMs and develop Measurement and Verification Plan