Existing Building Cx: Processes & Results
A Cultural Journey

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Learning Objectives

1. Define the key steps in the process of retrocommissioning an existing building.
2. Compare and contrast typical retrocommissioning findings by building type, size and climate.
3. Predict the range of savings attainable through retrocommissioning.
4. Avoid common pitfalls in the implementation and verification phases of a retrocommissioning project.
Man vs. Machine: The Culture of Retrocommissioning
That’s so retro…
Building Performance Tracking

Basic Tools
- Benchmarking/Utility Bill Analysis
- Energy Information System (EIS)
- Advance EIS

“Beyond Basic” Tools
- BAS (HVAC, Lighting)
- BAS Metrics
- Fault Detection/Diagnostics
Defining RCx

“A collaborative process that looks at how and why a building’s systems are operated and maintained as they are, and then identifies ways to improve overall building performance.”

A Retrocommissioning Guide for Building Owners
developed by PECI with funding from US EPA
Undefining RCx

RCx is *not* the same as:

- An energy audit
- Test & balance
- Controls calibration
- New building commissioning
Program Case Study

California utility-sponsored programs

- 25 commercial buildings
- 6.2 million square feet
- Findings
  - Electricity savings: 4.9%
  - Natural gas savings: 12.1%
  - Cost savings: $0.11/SF
  - Payback: 1.7 Yrs
Chicago utility-sponsored programs

- 6 commercial buildings
- 4.2 million square feet
- Findings
  - Electricity savings: 6.1%
  - Cost savings: $0.07/SF
  - Payback: 0.6 Yrs
Building Case Study

Chicago office building

- Baseboard electric heating control
- AHU fan pressurization

![Graph showing energy consumption from Jan 2009 to Mar 2011]

- 2009
- Apr’10 - Mar’11

- kWh (Millions)
Los Angeles office building

- Chiller staging

**Chiller Loading**
Daily Profile with CH-2 & 3 then CH-1 Running

![Chiller Loading Chart](image-url)
Typical RCx Top 10

1. Schedule HVAC Systems
2. Adjust Outside Air to Current Needs
3. Mitigate Simultaneous Heating and Cooling
4. Reduce Flow from Oversized Pumps
5. Reset Supply Air Temperatures
6. Enable Economizer Controls
7. Reset Static Pressures/Optimize VFD Operation
8. Stage Chillers Properly
9. Lower Condenser Water Setpoints
10. Correct Lighting Control Operation
Another Top 10

Top 10 Characteristics of a Retrocommissioning Provider
Number 10

Doesn’t like Top 10 lists or “cookie-cutter” approach
Number 9

Emulates Peter Falk as Columbo
Number 8

Has a love/hate relationship with utility incentive programs
Is good at, but doesn’t like to fill out forms
Is addicted to trend data - in massive doses
Number 5

Has multiple personalities

- Engineer
- Controls technician
- Psychologist/Therapist
Number 4

Loves to tell war stories
Number 3

Holds a secret nostalgia for pneumatic controls
Number 2

Feels a sense of accomplishment at the completion of a project, but always worries about the future.
Has a healthy skepticism about technology
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Thank You
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