Large Commercial Buildings: Re-tuning for Efficiency

Building Personality
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- Buildings start as children
  - Designed (parents)
    - By engineers with best guess information
    - For some weather conditions
    - Inside load conditions
    - For a specific number of occupants
    - For a specific solar gain and orientation
  - Built with (childhood years)
    - Low bid
    - Tight schedules
    - Limited inspections
    - Poor commissioning
Building Personality (cont.)

- Buildings grow to be teenagers
  - Usage, constant change (teenage years)
    - Weather impacts
    - Staff loading changes
    - Electrical computer loading changes
    - Equipment malfunctions that are not repaired
    - Design flaws that are not repaired
    - Cubical and wall reconfigurations without moving diffusers
    - Poor maintenance on equipment
      - Dampers
      - Controls
      - Valves
      - Air and water balance
Building Personality (cont.)

- Buildings grow to be adults
  - Current conditions (adulthood)
    - High energy cost
    - High complaints
    - Small number of zones driving large systems
    - Poor operations based on complaint response instead of the bigger picture
    - Still poor maintenance
Building Personality (cont.)

- Like children, you need to get to know your building
- What is its personality
  - How does it act or respond to changing internal conditions?
  - How does it respond to weather changes?
  - What is its balance point, when no heating and no cooling are required?
- It takes time and history to actually learn a facility
  - Need for operational history data
  - Need for complaint history
A psychologist will analyze a patient to learn a personality and then suggest changes in behavior or environment to help change that personality for a more acceptable response to their environment (happier person).

Personality tuning is the process of learning a facility and then gently modifying its control parameters and sequence of operations to achieve more desirable results (happier building with less energy usage and lower customer complaints).
QUESTIONS?

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