

LEED EB

Retro Commissioning Systems Optimization of Operations

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Measurement & Verification

- *When you can measure what you are speaking about, and express it in numbers, you know something about it, but, when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind: it may be the beginning of knowledge, but you have scarcely in your thoughts, advanced to the stage of science.*
- --Lord Kelvin, [1891-1894]



USGBC Requirements

- Prereq1- Cx Completed
- Energy Star Rating
- Renewable Resources
- O&M
- Metering & Measurement
- Documentation

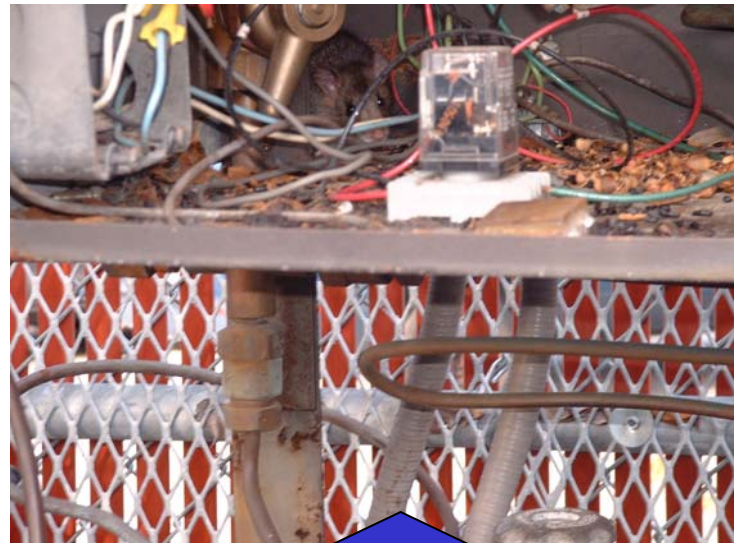
Retro-Commissioning

- Developing a Plan (Form Follows Function)
- Define Stakeholders & Accountabilities
- Benchmarking Existing Conditions
- Assessment of System Conditions
- Review Existing Data & Reports
- System Sequence of Operations
- Occupied Space Schedules
- Interviewing Staff

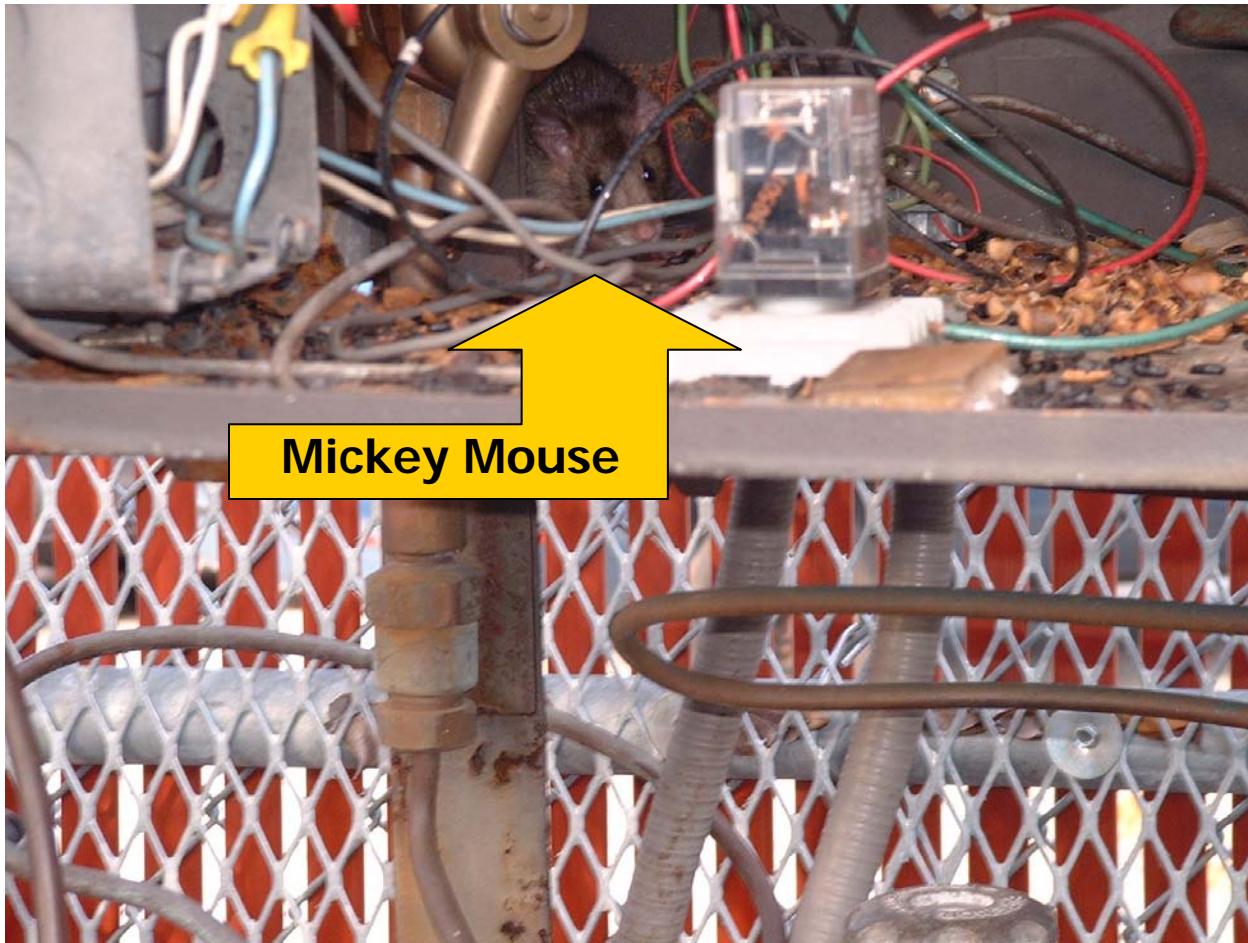


Retro-Commissioning Elements

- Exterior Site
- Envelop
- Mechanical
- Plumbing
- Electrical
- Equipment Specialty
- Trend Data Recovery



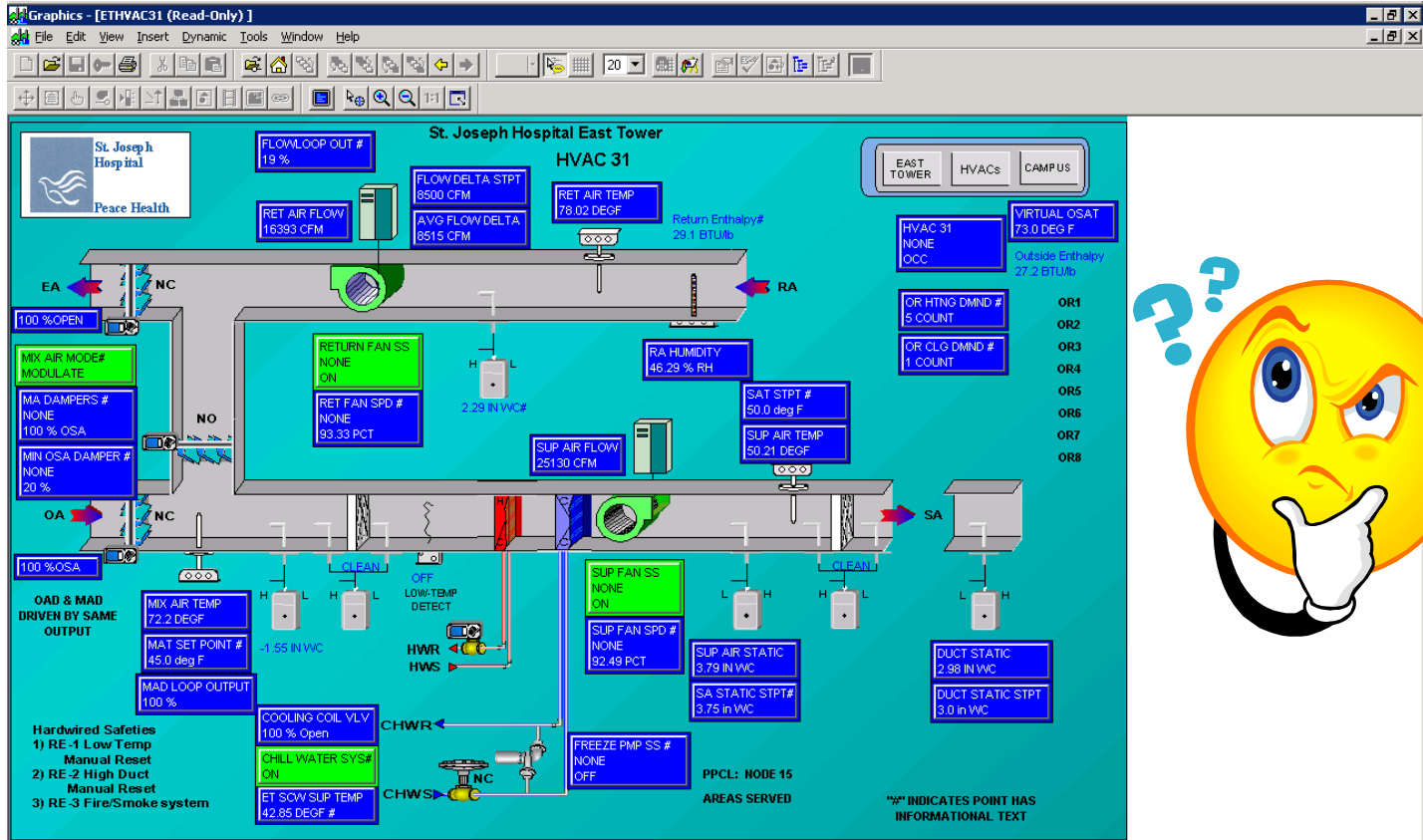
Be careful with what you find!



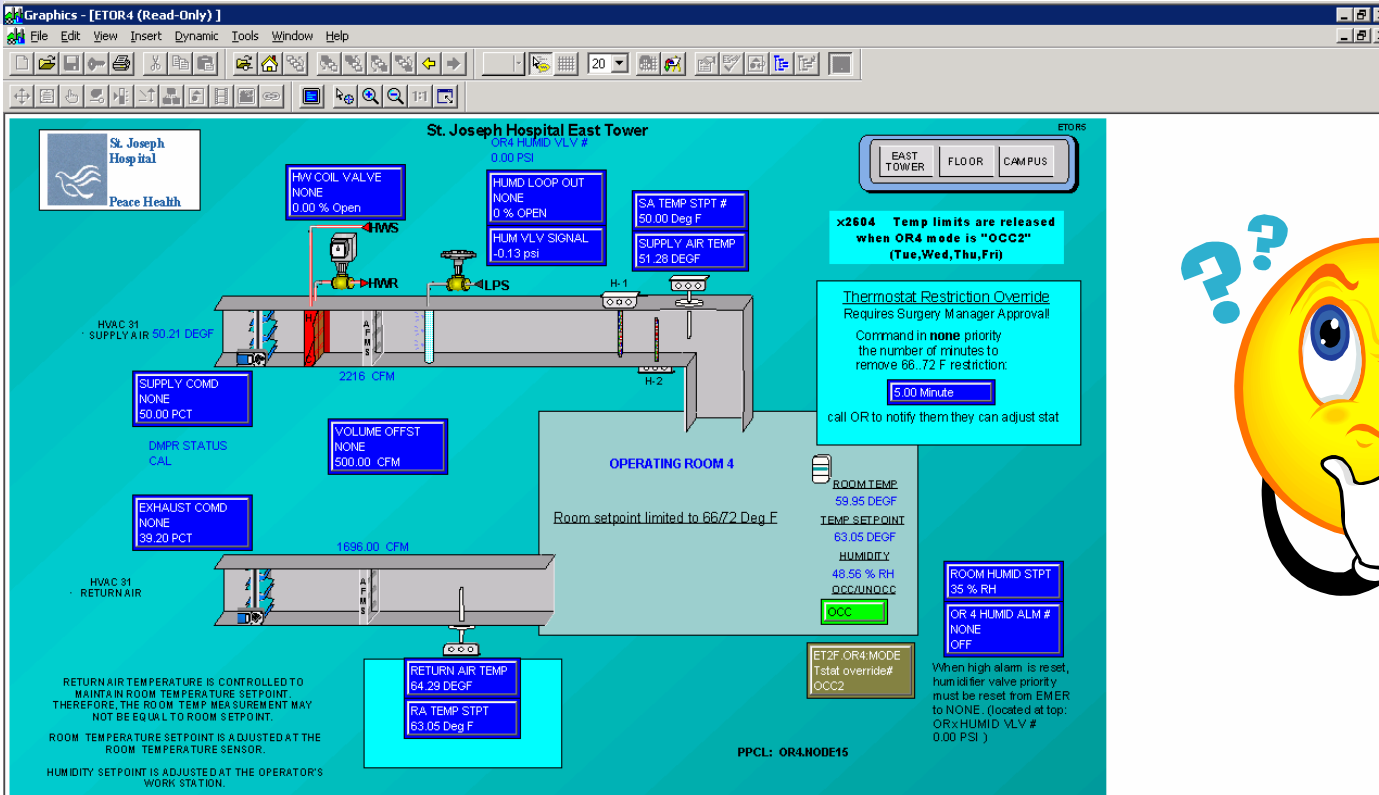
Med Gas
Manifold
Panel with
numerous
Issues.



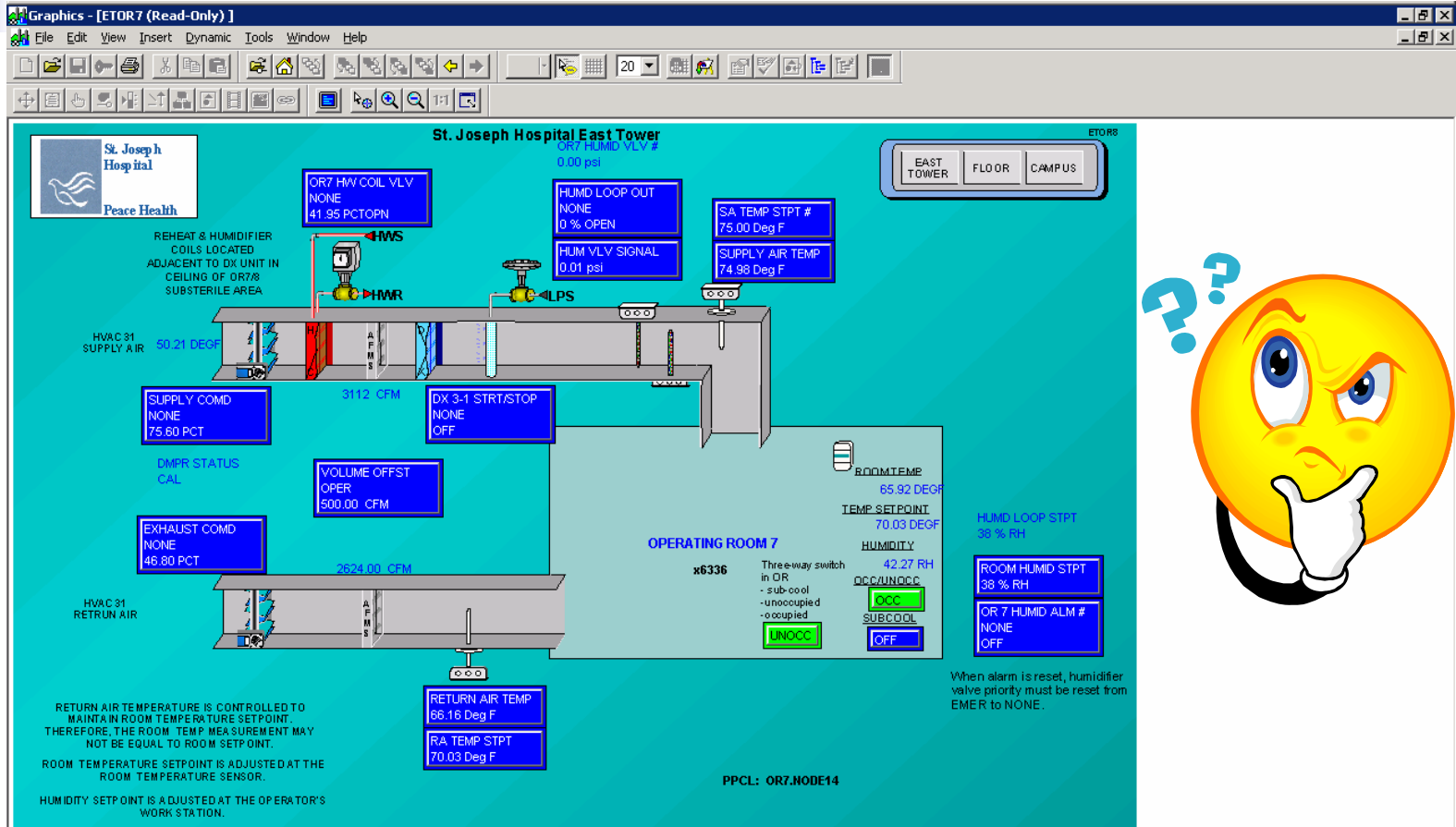
HVAC Unit Surgery Suites



Surgery Suite #4



Surgery Suite #7



Optimization Opportunities

- Scheduling
- Calibration
- Reset Schedules
- Tune-ups, General Maintenance
- Low Cost, with High Return
- Moderate Cost, with High Return
- High Cost, with High Return



Closeout

- Testing Verification & Results
- Energy Model the Results
- Owner/Operator Validation
- Training
- Action Plan
- Lessons Learned
- Final Recommendations





Lessons Learned

- Team Member Roles & Responsibilities
- FORM FOLLOWS FUNCTION
- Solution sets are not universal
- Who's in the Bldg & Who wants LEED?
- USGBC delays, upload & review
- Disconnect between Owner & Occupant



Lessons Learned- Continued

- Min. OSA set point may cost Owners
- Equip. may not meet min. standards
- No as-build Drawings or Data Available
- Control vendor support incentive
- Validate what is considered standard practice- What's Real Vs Perceived
- LEED process evolution

Questions & Confusion

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