

# ISHE ISSUES



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Retrocommissioning at Sullivan County Community Hospital

# RETROCOMMISSIONING AT SULLIVAN COUNTY COMMUNITY HOSPITAL

In 2012, Ron Shake, CHFM, Director of Facilities at Sullivan County Community Hospital, viewed a webinar by Duke Energy about retrocommissioning. The slides from the webinar are available in the appendix. As described in the webinar, retrocommissioning can help Duke Energy customers improve the efficiency of their operations through incentives and technical assistance for services that reduce energy consumption.

Retrocommissioning is a systematic process for identifying and making low cost improvements to a building's existing equipment, lighting, and control systems. For comparison, retrofitting involves replacing outdated equipment, while retrocommissioning focuses on improving the efficiency of what is already in place.

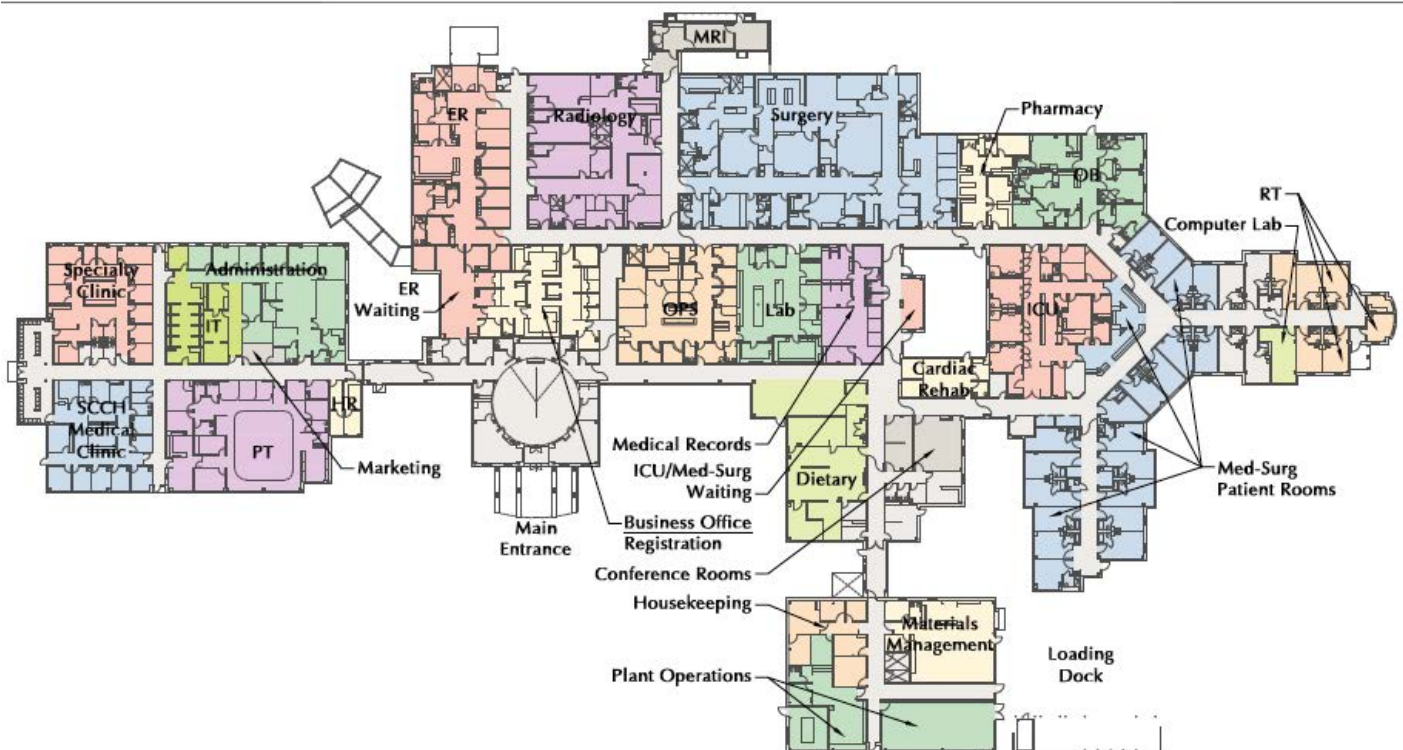
Done correctly, retrocommissioning can produce an average of 5% to 15% of a total building energy cost. By utilizing Duke Energy's Smart Saver incentives, these upgrades typically pay for themselves in energy savings alone within an average of three years.

As a result of the retrocommissioning process, a facility can typically hope to:

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

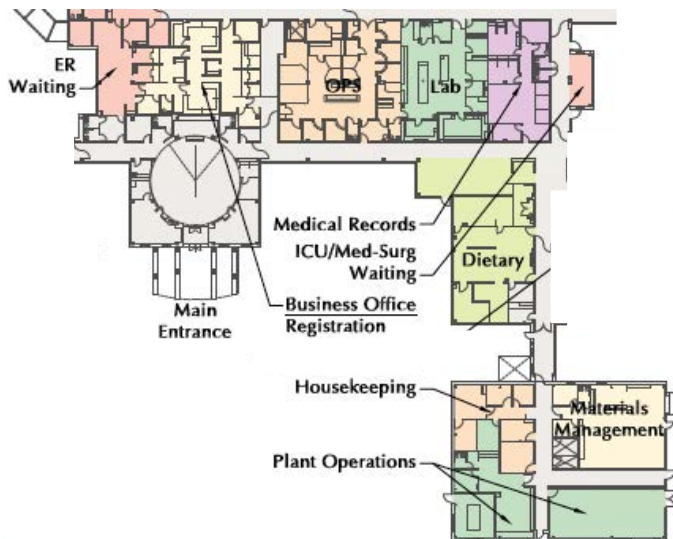
SULLIVAN COUNTY COMMUNITY HOSPITAL

Department Plan



The typical retrocommissioning process timeline is:

- 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 Saver 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



## GETTING STARTED AT SCCH

Interested in the possible savings for Sullivan County Community Hospital (SCCH), Shake initiated a retrocommissioning process. “I knew of the potential savings associated with retrocommissioning,” said Shake. “We were excited to see how we could bring that to SCCH.” The project would focus on controls upgrades and a compressor retrofit.

The retrocommissioning process at Sullivan County Community Hospital began with an onsite, in-depth assessment by Duke Energy, Working Buildings, and the SCCH staff. The assessment costs were split between Duke Energy and the hospital.

The result was the creation of Energy Conservation Measures (ECMs). These were the basis for a presentation to SCCH’s CEO & CFO regarding potential savings.

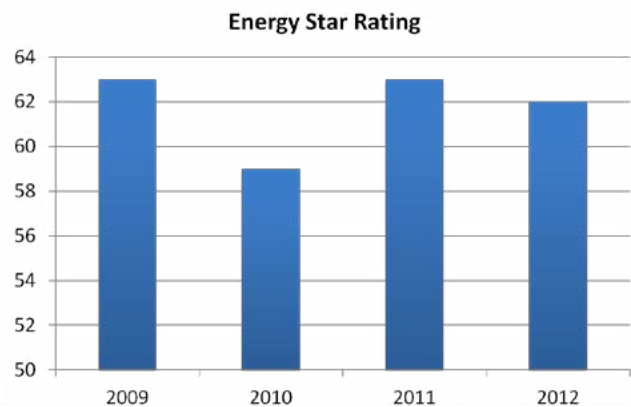
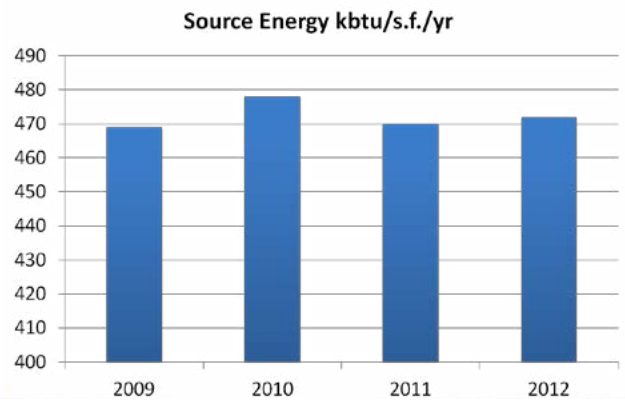
## PROCESS / ANSWERS

The presentation of the retrocommissioning process was well received. With interest high, several follow up questions came out of the meeting. Answers were summarized by Working Buildings:

- Duke Energy does not guarantee any incentive amount in writing at this point in the process.
- The process is for Working Buildings to investigate more and develop details about the hospital’s systems so that Working Buildings can use those as the basis for complex engineering calculations that will be submitted through the Duke Energy custom incentive process.
- The information in the Phase 1 report (see the appendix) includes preliminary estimates of costs and savings. These estimates do not contain enough detail for submitting an application.

## Sullivan Energy Performance

- An engineering fee is needed for the work required to develop that detail and also to develop working control methodology that will be applied for conversion of SCCH's controls after the incentive offer letter is received by SCCH. This is specialized work that requires Working Buildings' expertise.
- After Working Buildings develops the details in Phase 2, it should be noted that the estimates of costs and savings will likely change, as they are more accurate.
- If there are ECMs with greater than 4 year payback, then SCCH is not expected by Duke to implement those, although SCCH may choose to do so and incentives may be available for those ECMs.
- If there are ECMs with less than 1 year payback, incentives are not available.
- Working Buildings will work with SCCH to help in choosing the ECMs to implement. It is implied through SCCH's participation in the process that SCCH is willing to implement ECMs with a 2-4 year payback. Duke offers custom incentives for the purpose of reducing the cost and improving the payback of those ECMs.
- Following Phase 2 - Investigation: Working Buildings will enter into Phase 3 - Project Organization. In that phase, Working Buildings will prepare all of the documentation including backup calculations that are required to apply for the incentives. The costs for the time for Working Buildings to prepare this application is included in its fee for the next phases.
- After SCCH signs the application for the incentives, then Duke has a third party energy engineering company review all of the calculations. Based on Working Buildings' past experience, this review is extensive. If there are questions to be answered or modifications to calculations required, Working Buildings will take care of that part of the process. The estimates of savings are based on laws of physics and principles of thermodynamics and fluid mechanics. At this point the savings calculations will have been independently reviewed for accuracy and realism. The estimated savings are based upon historic weather data and assumptions about how SCCH will operate its equipment and cannot be guaranteed by Working Buildings or by Duke.

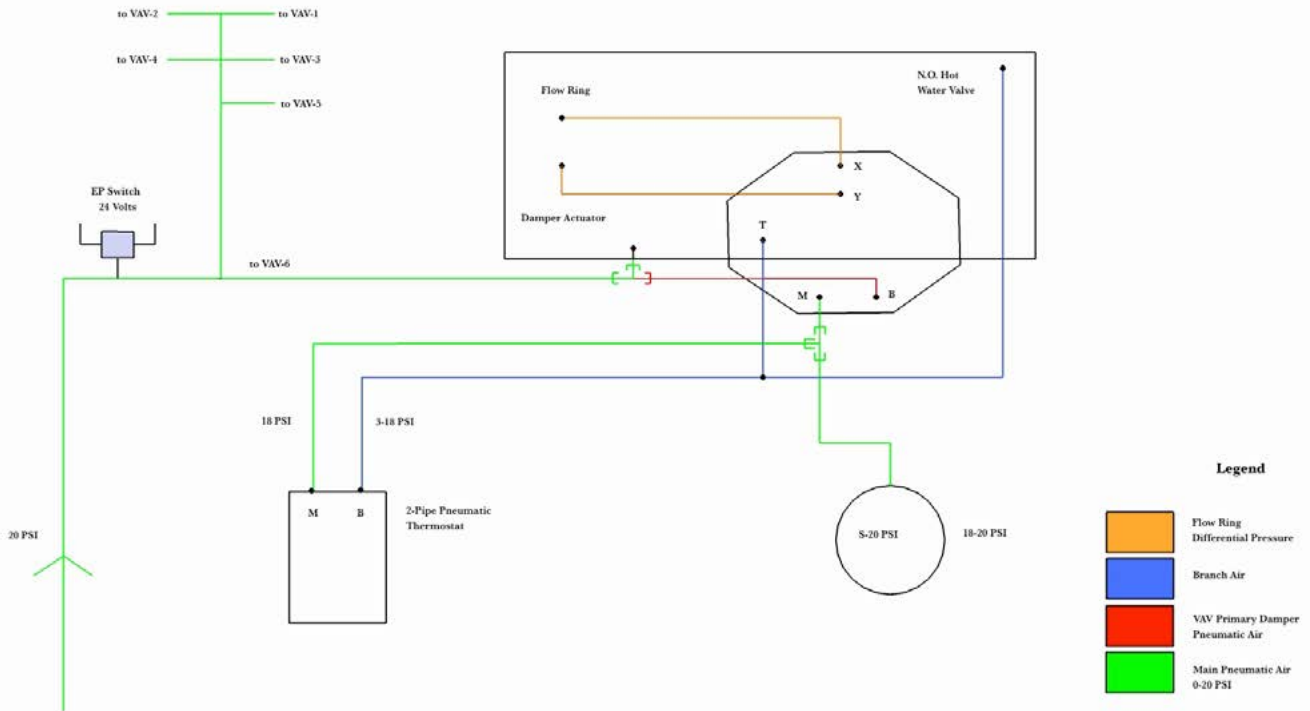


- After the review is completed, then Duke Energy calculates the amount of the incentive that they will offer. The formula for that calculation is not public information, so Working Buildings cannot predict with certainty what the outcome will be. However, based on past experience, the incentive amounts can be approximately equivalent to the first year's electricity savings.
- After the incentive offer letter is sent to SCCH, it must be accepted. Only then may the project begin. No equipment or purchase orders for energy improvements may be issued prior to accepting the incentive offer, or the offer will be withdrawn.





Variable Air Volume (VAV-6)



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“The process went pretty much as described,” said Shake. “The detailed research and engineering company review helped ensure that we had the right equipment, correct specifications, and best plan.”

Details on the plans and process have been graciously shared by Sullivan County Community Hospital and Working Buildings and are available in the appendix. In summary, they included:

**RTU-3 - Business Office**

- Furnish and install one digital output point that can be scheduled on/off at BAS with relay for occupied/unoccupied condition.
- Provide zone temperature sensor in lobby for purpose of controlling a night setback/setup condition for the unoccupied mode.
- Program/enable night setback/setup for unoccupied condition based on lobby zone temperature sensor.

**RTU-6 - Dietary, Mail Room, & Main Electrical Room**

- Provide zone temperature sensor in cafeteria for purpose of controlling a night setback/setup condition for the unoccupied mode.
- Provide zone temperature sensor in electrical room for purpose of providing alarm if temperature is too hot. (OPTIONAL)
- Program/enable night setback/setup for unoccupied condition based on zone temperature sensor.

**AHU-1**

- Program new sequence of operation (provided by WB) for AHU-1 to include night operation mode with reduced airflow, new VFD, and remote control/monitoring of new Trane compressor/condensing unit.

**SUMMARY**

The total estimated cost of the ECM project including Duke Energy, Working Buildings, & outside contractor fees was \$99,100. Actual cost is coming in at ~ \$70,000 with an estimated \$15,200 electric and \$5,500 gas savings per year. The Duke Energy Smart Saver Custom Incentive check shall be \$20,800 upon final completion and testing in the spring of 2014.

“The project was very successful,” said Shake. “It was a true team effort that included Scott Hughbanks, our HVAC Technician, Hoy Bohanon from Working Buildings, and Dwayne Owens from Duke Energy.”

“The mission of Sullivan County Community Hospital is to create a compassionate, innovative, healing environment for our community,” continued Shake. “Thanks to projects like this, I’m proud to say we are delivering on that mission, and doing so in a cost effective way. I would wholeheartedly recommend the retrocommissioning process to other Indiana healthcare facilities.”

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## APPENDIX: REFERENCE DOCUMENTS

Several documents are available via the links below:

- [Equipment Specs: Information needed for the VAV unit additions, kitchen supply fans, and AHU-1 VFD](#)
  - [Catalog document: The spec of the electrical room fan](#)
  - [Maintenance Scope](#)
  - [JCI Scope](#)
  - [Mechanical Scope](#)
  - [Sequence of operations for the three air handlers, RTU-3's VAV units, and the electrical room fan](#)
  - [Duke Energy webinar slides](#)
  - [Kickoff meeting minutes](#)
  - [Phase 1 report](#)
  - [Phase 2 report](#)
  - [ASHE presentation on "Retrocommissioning and Energy Saving for Regional Hospitals" by Hoy Bohanon and Ron Shake, CHFM at the ASHE Conference](#)
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