

# FEDERAL GOVERNMENT "BUILDING X" RCx STUDY

## CASE STUDY



### QUICK GLIMPSE

<b>Customer</b>	"Building X"
<b>Measures Implemented</b>	Retro-Commissioning Study
<b>Total RCx Study Cost</b>	\$25,800.00
<b>Incentives Received</b>	\$21,497 - RCx Study \$22,900- ECMs Implemented during RCx study
<b>Total Possible Projects Found:</b>	18 - Energy Conservation Measures (ECMs) 21- Repair/Maintenance Advisories 5 – Occupant Comfort Advisories
<b>Total Potential Savings Found:</b>	>\$70,867 Annual Savings
<b>Energy Star Score</b>	Before: 11 After: 45

### BASELINE

A secure government office building in Illinois spans over 71,656 square feet. In 2013, the all-electric building consumed 3,424,896 kWh with an annual cost of nearly \$400,000. Concern over the rising cost of utilities drove "Building X" to seek ways to improve the performance of their building. "Building X" hired Ruyle Mechanical Services to conduct a retro-commissioning (RCx) study analyzing all mechanical equipment, the building automation system (BAS), lighting, plug loads, and the building envelope.

### OUR SOLUTION

Ruyle Mechanical Services began the RCx study by benchmarking "Building X" with the EPA's Energy Star Portfolio Manager. "Building X" score was an 11. The study involved addressing areas that were experiencing comfort complaints. The most significant discovery was the unbalanced air flow from the roof top units (RTUs) and the variable-air-volume terminal boxes (VAVs) in each zone. Ruyle conducted a building equipment survey, reviewed maintenance records, conducted a utility analysis, led occupant interviews, analyzed existing building system operations through data loggers, and reviewed BAS schedules and set points to arrive at 18 Energy Conservation Measures (ECMs) for recommendation.

All Ruyle and ECSI staff adhered to all necessary security clearance requirements. The staff researched energy usage and building performance in "Building X", along with implementing fixes as the study was conducted. The following items were accomplished:

- Rate Change to appropriate utility electric rate
- Repair failed economizer on RTU
- Upgrade drives and belts on RTU
- Clean, calibrate, and re-program VAV boxes
- Set up fan speed in fan powered boxes
- Supply static pressure and building pressure sensor for AHU
- Repair condenser fan chiller
- Program, asses, and adjust BAS
- Implement programmable thermostats
- Replace condenser fan motor and capacitor on RTU
- Replace outdoor air washable filters on RTU
- Implement BAS trend data
- Reprogram primary/secondary systems for maximum efficiency
- Augment cooling in a server room
- Repair pressure issues in rooms

### BENEFITS

The benefits of the RCx study were immediate. Correcting the utility rate to the appropriate cost, saved "Building X", \$4,380.00 annually, at no cost. The local utility company provided an incentive of \$0.30 per square foot, for a total of \$21,497 for the RCx. "Building X" received an additional \$22,900 for ECMs implemented during the study. Ruyle provided a full report and presentation to "Building X" reviewing what was implemented, an action plan for further implementation of ECMs, and a better understanding of how and where energy was used in their facility. By the end of the RCx study, "Building X" improved their Energy Star Portfolio Manager score to 45. Implementing additional ECMs from the action plan provided by Ruyle would continue to raise "Building X" score.

