

Radford University

Energy Management Program

Johnson Controls Metasys

- In 1980, Radford University added Johnson Controls 8540 Controls for Building Automation.
- The 8540 Controls have been replaced with newer components as they became available.
- The campus now has M5/PMI with Network Control Modules and ADX with Network Integration Engines' and Network Application Engines' components in place.

Campus Lighting

- The campus Outside Lighting is controlled from the BAS program that calculates sunrise and sun-set times from latitude and longitude to bring on the lights and turn them off.
- This is more efficient than the earlier photocells.

Ice Storage

- The campus has five buildings that have ice storage and Fine Arts (under construction) that will have ice storage.
- During peak KW usage, the BAS Demand Limiting/Load Rolling program will raise the Chill Water Set point on the chiller to the highest setting possible which turns off the compressors and use the ice that was built during the night to cool the building.



Waldron and International Education Buildings Ice Tanks

There are four tanks for Waldron College Building and three tanks for International Education Building.

Dormitory Controls

- We have occupancy sensors and window contacts in place for five of the dorms on campus.
- If the window is opened, it opens the contact from a magnet on the window and changes the room set points to unoccupied settings.
- This turns off the Fan Coil unit in the room.
- The same occurs when the room is unoccupied as sensed by the infrared occupancy sensor.



Magnet on Window

The magnet is located on the window. When the window is opened, the contact becomes open back to the controller.



Magnet wiring.

The wire for the magnet goes through the wall at the window and back to the controller in the Fan Coil Unit.

Performance Contracting

- In 2006, Johnson Controls added insulation to mechanical rooms and entrances on campus.
- Weather-stripping was added to mechanical room doors and exterior doors.



Insulation added at Cook Hall

The performance contractor added board insulation with blown in insulation around the panels for the attic area of Cook Hall.



Weather Stripping added at Mechanical Room Doors.

The performance contracted added weather stripping at all Mechanical Room doors.

Lighting Upgrade

- In 1995, we began using T8 Electronic Ballast and Compact Fluorescent Light bulb's (CFL's) installed over entire campus.
- We are in the process of changing desk lamps to CFL's using bulbs provided by DMME.

VFD's and Energy Efficient Motors

- We are using VFD's and Energy Efficient Motors for pumps and fans.

Motion Sensors

- Motion Sensors have been installed in Restrooms, Classrooms, Conference Rooms and Large Assembly Rooms over entire campus that control the lighting.

Economizer with CO2 Sensor

- Economizer Air Handling Units have been changed to CO2 in the Return Air Duct instead of Outside Air Temperature set points.
- This cuts down on heating/cooling at the AHU's in summer and winter.

VAV Air Handlers Reset

- We reset the Discharge Air and Mixed Air Set points based on Outside Air Temperature.
- This reduces the amount of reheat used in the building.

Chill Water and Hot Water Reset

- Chill Water and Hot Water Reset from Outside Air Temperature.
- The Chill Water is reset up on lower Outside Air temperatures.
- The Hot Water is reset down on higher Outside Air Temperatures.
- Chill Water Pumps, Chillers, and Hot Water Pumps are brought on by Outside Air Set points.

Scheduling of Equipment

- Schedules are used to take the equipment unoccupied at night with lower heating and higher cooling set points.
- We also use Optimal start/stop which determines from the Outside Air Temperature and Zone temperatures when to bring equipment on to have the space temperature at set point when occupants arrive.

Demand Limiting/Load Rolling

- We use a campus KW meter located at the sub-station to use Johnson Controls Demand Limit/Load Rolling feature.
- This is when the ice storage is used. Ice Storage and Chill Water Reset is used through the program to lower the campus KW.
- AHU's in gyms and auditoriums are turned off periodically during the day as well.

Steam Driven Condensate Pumps

- We have started to convert electric condensate pumps to steam driven pumps.

Continuous Re-Commissioning

- We are in the process of starting Continuous Re-Commissioning for the campus.
- The Department of Energy estimates a 20-35% savings from doing this.
- We will work with a test and balance company to reevaluate building operation to make sure we are as efficient as we can be.
- FEMP (Federal Energy Management

Trap Survey

- We have also started a new trap survey to find all problems with the steam flow system on campus.
- The amount of energy lost through bad traps is substantial and needs to be done on a continual basis.