UES SSC Funding Application

Wohlers Hall
&
Temple Hoyne Buell Hall

Dylan Peplinskie – 4/24/2023

Facilities & Services
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Agenda

- UES overview
  - About us
  - Results
  - Meet the team
- Wohlers Hall HVAC Controls Upgrade
  - Project overview
  - Scope & summary
- Temple Hoyne Buell Hall DDC Upgrade
  - Project overview
  - Scope & summary

Utilities & Energy Services

Utilities & Energy Services

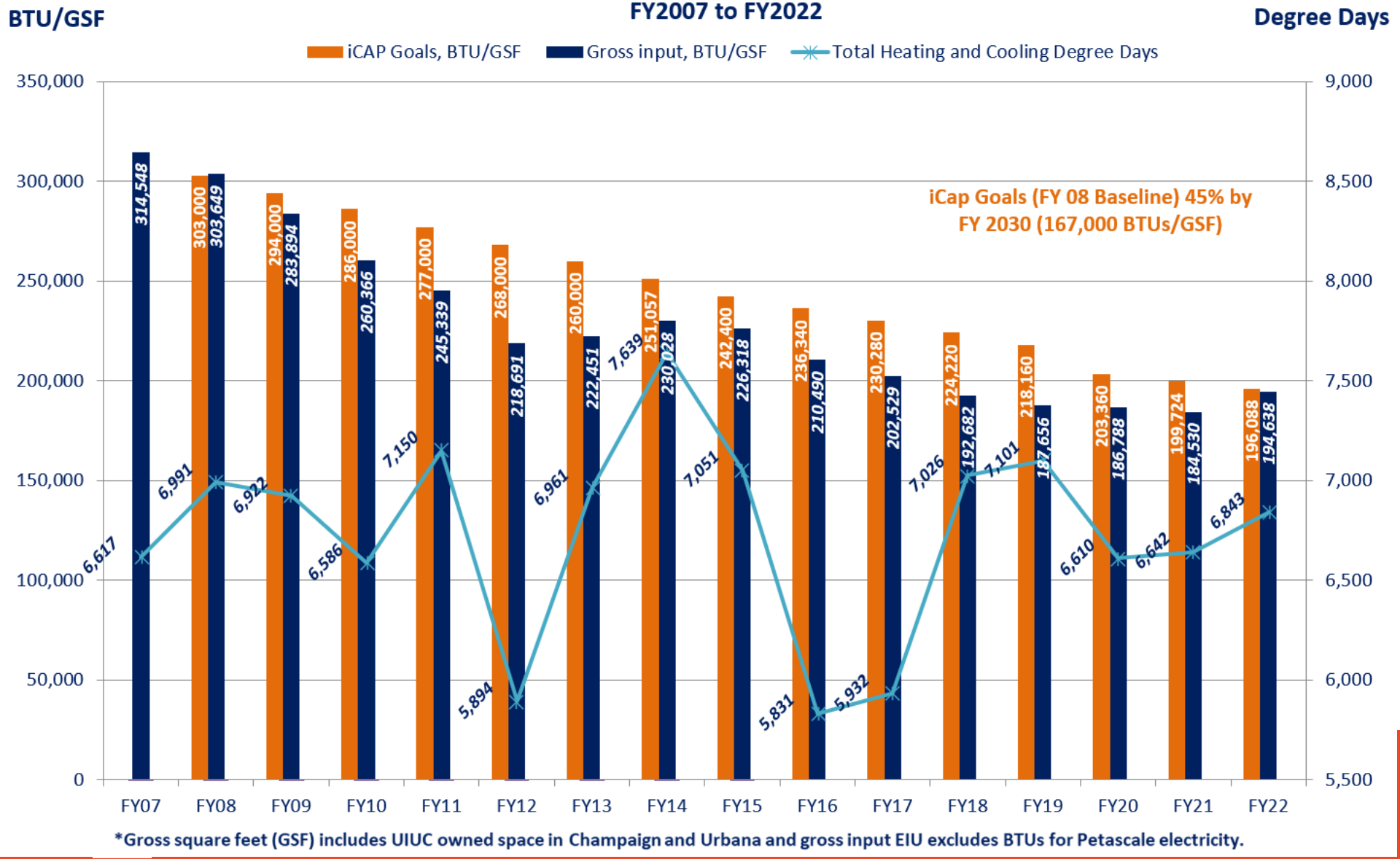
- Business Operations
- Energy Conservation
  - Recommissioning
- Production
  - Abbot Power Plant
- EMS Controls
  - Shop 41 & 55
  - Energy Management Control Center

Utilities & Energy Services Results

- 5 Recommissioning Teams
  - 2-3 Buildings per team per year
- 27% average reduced energy usage per building
  - 53% Coordinated Science Laboratory
  - 50% Engineering Hall
- Over $110M saved since 2007

Facilities & Services
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Utilities & Energy Services Division
Energy Utility Index (EUI)-BTU/GSF
FY2007 to FY2022



*Gross square feet (GSF) includes UIUC owned space in Champaign and Urbana and gross input EIU excludes BTUs for Petascale electricity.

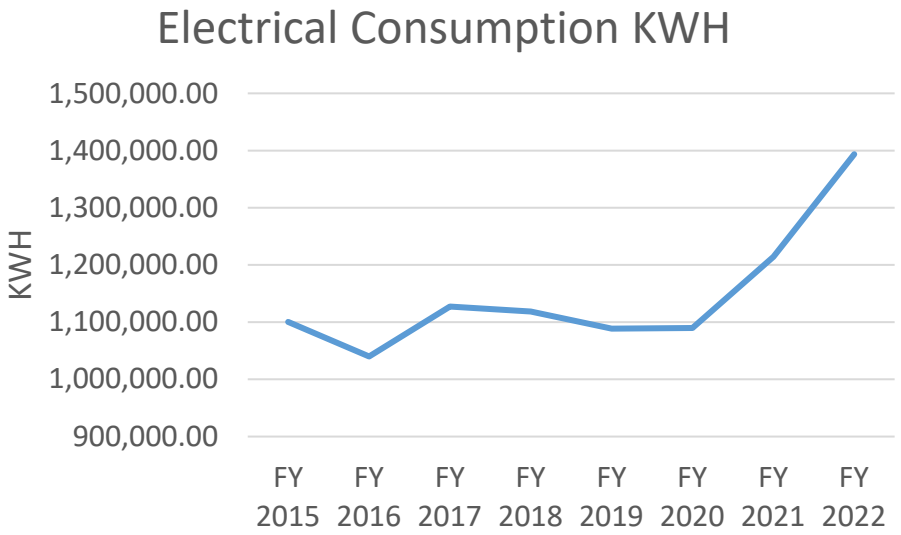
Utilities & Energy Services Recommissioning Team

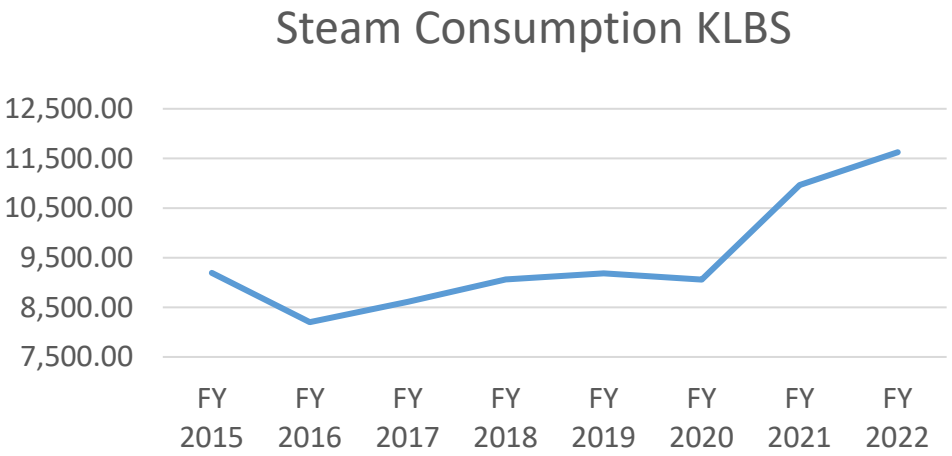
- David Hardin – Associate Director of UES
- William Shafer – Shop PM Electrician
- Justin Brooks – Shop PM Temperature Control Mechanic
- Harold Gross – Shop PM Sheet Metal Worker & Air Balance
- Dylan Peplinskie – Shop PM Management Engineer

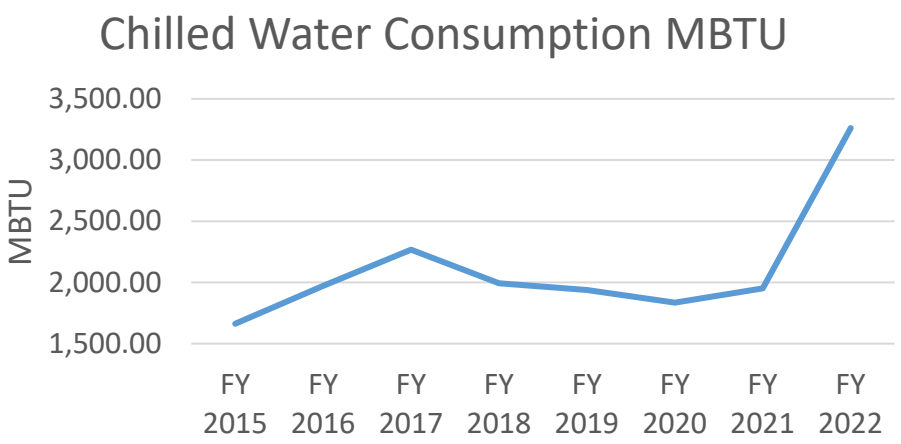
Wohlers Hall HVAC Controls Upgrade

Wohlers Hall

- Increased energy usage since 2016
  - Steam – 27%
  - Electrical 16%
  - Chilled Water 56%



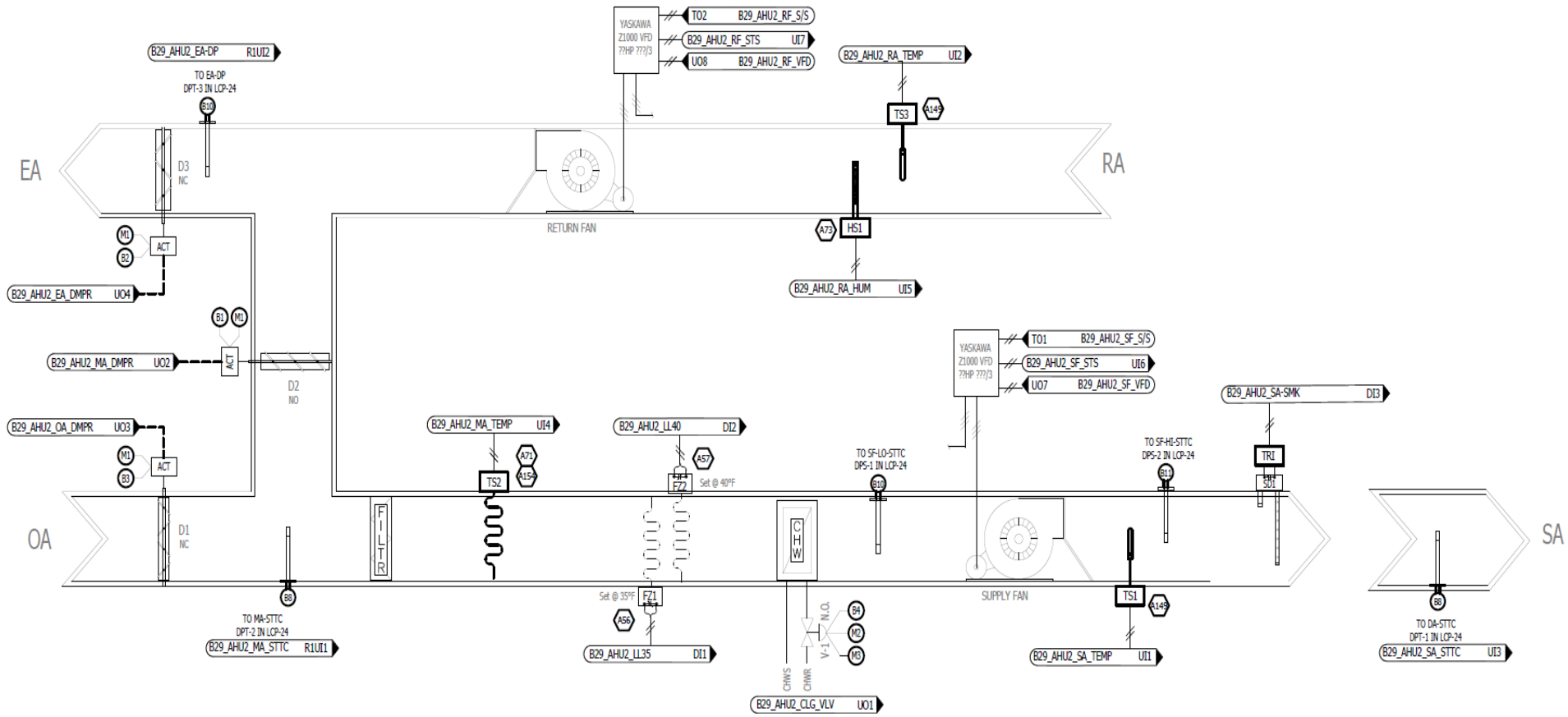




Wohlers Hall

- Increased energy usage due to:
  - Age of equipment – 9 air handling units
    - Return air dampers
    - Equipment controller
    - Instruments
  - Control sequence
    - No summer/winter setbacks
  - Unit design
    - Unable to draw in outdoor air
    - Poor economization

Air Handling Unit Layout



Wohlers Hall - Project Scope

- Repair equipment
  - Return air dampers
  - Instruments
- Replace controller
  - Siemens 24 point compact to 36 point compact
- Re-locate down duct pressure sensor
- Implement summer/winter setbacks
- Add minimum outdoor air damper & airflow monitoring

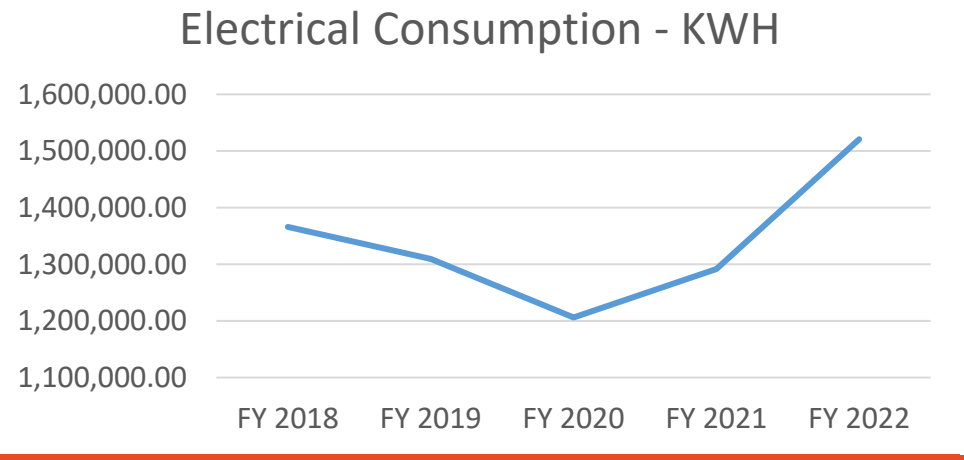
Wohlers Hall - Project Cost & Goals

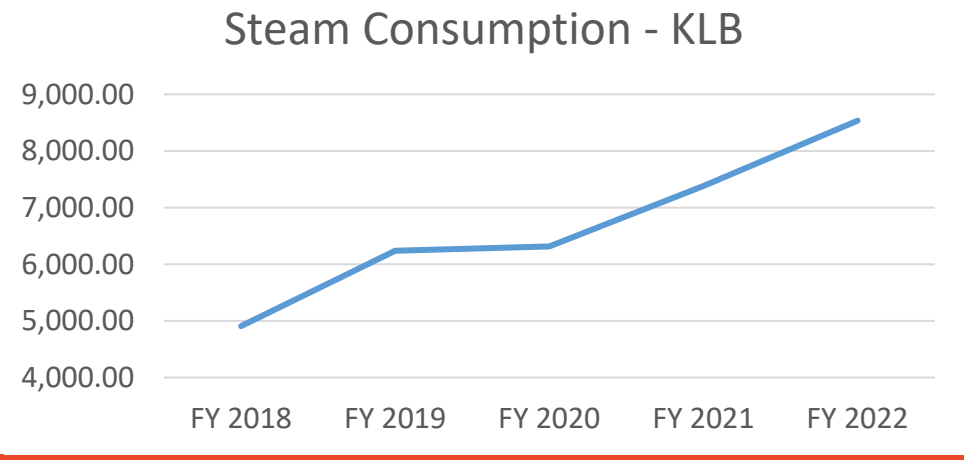
- Total cost - $450,000
  - $150,000 UES
  - $150,000 Deferred Maintenance
  - $150,000 SSC
- Total project timeframe – 5 months
- Goals
  - Reduced steam, chilled water, and electrical usage to 2016 values
  - ~$85,000 annual utilities cost avoided
  - Project payback – 5.5 years

Temple Hoyne Buell Hall
Direct Digital Controls (DDC) Upgrade of Room Equipment

Temple Hoyne Buell Hall

- Increased energy usage since 2018
  - Electrical – 11%
  - Steam – 42%





Temple Hoyne Buell Hall

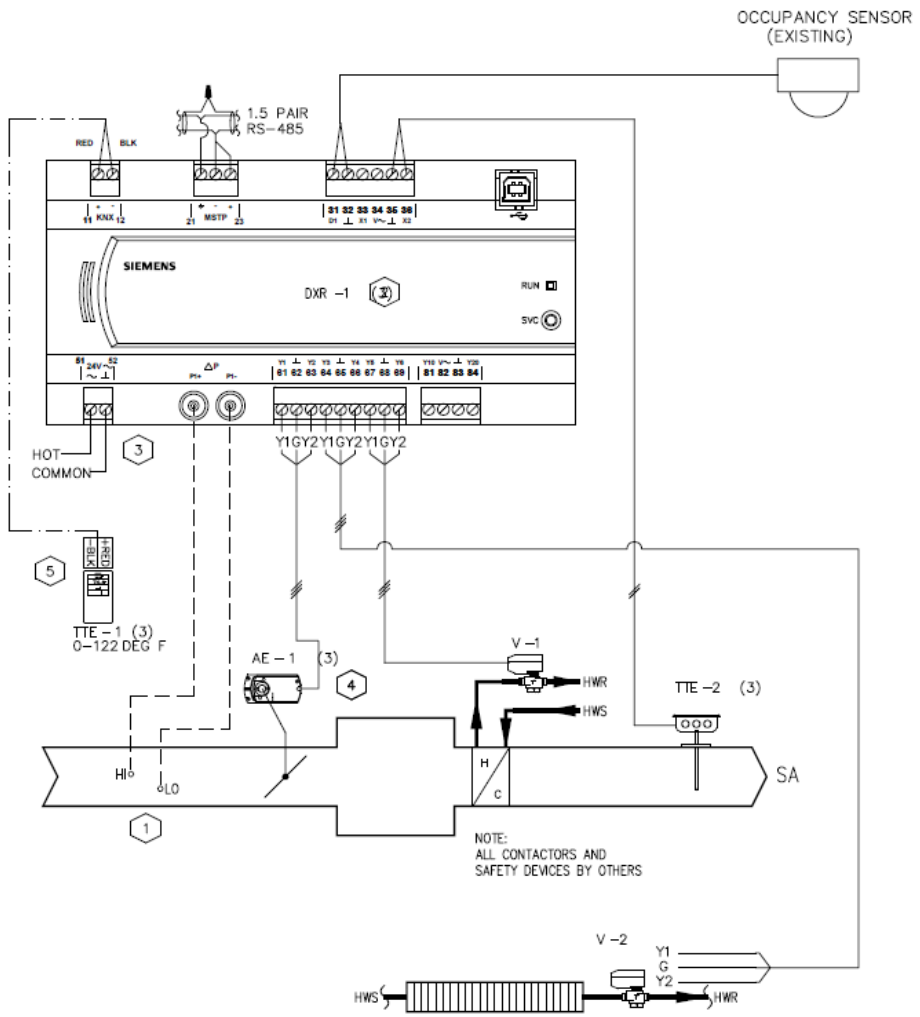
- Increased usage due to:
  - Age of equipment
    - Pneumatic controllers – cannot be programmed
    - No nighttime and unoccupied setback
  - Failed equipment
    - Older pneumatic controllers with high failure rate
    - Hidden failures as equipment is not monitored
    - Failed re-heat and perimeter heating valves
  - Poor design
    - Supply air fighting perimeter heating coils

THBH – Project Scope

- Replace existing 98 pneumatic variable air volume (VAV) controllers with direct digital control (DDC)
  - New network and power connections to all rooms
  - Occupancy sensors and electrical infrastructure
  - Piping modifications and valve replacement
  - New controller and thermostat installation
  - Demolition of old controller and pneumatic piping
  - Test, adjust, and balance new controller

Variable Air Volume Box

- New controller
- New occupancy sensor as needed
- Valve/damper actuators
- Network and power connection



THBH – Project Cost & Goals

- Total project cost - $600,000
  - $150,000 UES Energy Conservation
  - $150,000 Deferred Maintenance
  - $150,000 Revolving Loan Fund
  - $150,000 SSC
- Total project timeline – 9 months (estimated)
- Goals
  - Reduce steam and electrical use to 2018 values
  - $95,000 estimated annual savings
  - 6.3 year payback (or less)

Questions?