OBJECTIVE OF STANDARD

- To acquaint designers and other interested parties with the University’s provisions for building automation control systems (BACS) within individual buildings and for centralized (BACS) on the main campus.
- To insure consistent specifications for, and installation of, building automation control system hardware and software within campus buildings and campus-wide network interface between building systems.
- To extend the University’s capabilities for remotely monitoring the environmental status of all campus buildings.

METHODS OF DELIVERY OF BUILDING CONTROLS SYSTEMS

- Contract with Automated Logic (AL) or Johnson Controls (JCI) as a subcontractor to the mechanical contractor, while utilizing the State Contract. This has the disadvantage of adding the G/C’s markup, but with the benefit of “single source” responsibility for the project.
- Depending on the project requirements, contract directly with AL or JCI. Consult the DCM Project Manager (PM).
- Specifications should reflect that AL or JCI are the sole providers of BACS.

BUILDING INFRASTRUCTURE

Assume that existing campus buildings have the NAE (JCI Metasys front end) and N2 buss and require no further infrastructure. Extensive building renovations may require upgrading the NAE, please consult with DCM Project Manager (PM) and JCI.

If the building is new, it will require provision of infrastructure for connection to the campus BACS. This includes, at minimum, a dedicated 120V, 20A branch circuit for the NAE. A double-gang box with single-gang plaster ring and a 1-1/4” conduit from the NAE to the nearest NTS closet.

EQUIPMENT

Provide H-O-A switches on all motor starters, even those that are controlled by BACS. Variable speed drives (VSD) shall be Danfoss brand and can be supplied by JCI. Provide manual bypass on all VSDs.

EQUIPMENT CONTROL POINTS

This is a list of the control points, strategies, and equipment that the University will require, where applicable, on future building construction projects. The DESIGNER shall provide a point list and sequence of operation for all listed equipment. The DESIGNER shall review...
Johnson Controls shop drawings for compliance with the design intent.

Except when noted as local, these points will be on the BACS.

- **Chiller**
  - Status
  - Condenser water temperature (EWT/LWT)
  - Chilled water temperature (EWT/LWT)
  - Current
  - Fault/alarm contact(s)

- **Refrigerant Monitor**
  - Alarm
  - PM (local)
  - PPM (Metasys)

- **Surge Suppression**
  - Phase module failure

- **Pumps (All)**
  - Status

- **Boiler (Steam or Hot Water)**
  - Alarm
  - Status
  - Call for heat
  - Steam pressure
  - Steam flow
  - Firing rate

- **Hot Water Systems (Reheat or Domestic)**
  - Supply water temp.
  - Return water temp.

- **Sump Level (Elevator and Other) / Water Detection**
  - Alarm

- **Emergency Generator**
  - Alarm
  - Generator status
  - Transfer switch status

- **Battery/Inverter Systems**
  - Alarm
  - Status
  - Lamp out
  - Others as required for NFPA 101 compliance
- Variable Speed Drive (VSD)
  - Status
  - Speed
  - Speed command
  - Safety circuit
  - Current

- Cold Room / Freezer Monitoring
  - Status / Alarm
  - Temp

- Air Handling Units
  - RA CO2
  - RA damper (%)
  - OA damper (%)
  - Filter status
  - MA temp.
  - MA low limit
  - PH temp
  - CC (or cold deck) temp
  - Hot deck temp
  - DA temp
  - OA temp
  - OA RH %
  - RA temp
  - RA RH%
  - VSD (as above)
  - RH%
  - Humidifier status
  - Humidifier alarm
  - Chilled water valve (%)
  - Steam valve (%)
  - Heating hot water valve (%)
  - Discharge static pressure
  - Occupied/Unoccupied
  - Enthalpy

- Utility Metering
  - Natural gas usage
  - Steam usage
  - Water usage
  - Electricity demand / usage

CONTROL STRATEGIES
- HVAC Terminal Boxes
  - Occupied / Unoccupied Control

- Air Handling Units
  - Occupied / Unoccupied Control

- Chemical Fume Hoods
  - Sash position monitor
  - Status

- Lawn Irrigation
  - Master control
  - Flow monitor

- Street Lighting Master Photocell
Current monitor