PUGET SOUND ENERGY

GRANT ATTACHMENT D Project # _____

Controls Upgrade: Requirements Checklist (12/31/2023)

See full detailed requirements in "PSE Controls Upgrades: Requirement Details 12/31/2022"

PROJECT NAME: _____DATE:_____

REQUIRED: CONTROL/FEATURES

To qualify the upgrade must add or substantially modify 3 or more sequences/system capabilities. Also, all sequences and items listed under the required section are needed in the final system and project unless waived by PSE. If an item is not being added, please explain why at the bottom of this page.

Check boxes to show if existing or NA and if will be added or modified. Provide explanations at bottom.

Exists	Add	Modify	NA	General Description
HVAC non-CENTRAL PLANT SEQUENCES				
				Zone level scheduling & limited time override
				Optimum start/stop (OSS) for warm-up and for cool-down
				Unoccupied (night) set-back with zone limited time override
				Supply air temperature (SAT) reset based on load
				Duct static pressure (DSP) reset based on load
				Demand controlled ventilation (DCV) in interior spaces with single zone system
				Upgrade to VFD (from inlet vane or from constant volume to variable speed)
				Zone box air & temperature controls (specifics depend on if new box/box controls)
				Air-side economizer controls (integrated, lockout based on RAT, mech. clg. lock-out)
				Room space temperatures setpoints deadband
				HEAT PUMPS ONLY: Air-side heat pumps strip heating control
				LABS ONLY: Exhaust and OA ventilation based on fume hood and room use
CENTRAL PLANT SEQUENCES (If no Central Plant skip this section)				
				WSHP loop temperature setpoints deadband and maximums
				Differential pressure (DP) control for building loop pump(s) >10 hp
				Efficient cooling tower and chiller staging
				Condenser water temperature (CWT) reset based on load
				Chilled water temperature (CHWT) reset based on load
				Hot water temperature (HWT) reset based on load
				Boiler and chiller plant lockout on outside air temperature (OAT)
				Efficient boiler modulation and staging
REQUIRED GRAPHICAL USER INTERFACE (in text - means on GUI but not adjustable by operator)				
				AHU graphic in text: final setpoints, key controlling variables w/explanation
				AHU graphic: schedule name, air & supply water temps, total box cfm, other key pts
				Central plant graphic in text: final setpoints, key controlling variables w/ explanation
				Floor plan in text: location of remote key sensors and AHU zones
				Zone/Box graphic: AHU serving box, design cfms in text, incoming air and water temperature, schedule, if available – discharge air temperature
				Zone/Box table: key points, AHU serving box, schedule, reset logic interaction
				VFD s in text: actual speed of VFD when command signal is 0 (if does not equal 0)
				Digital easy access to: controls sequences, drawings and submittal; Facility Guide
				Outside air temperature (OAT): on all pages

EXPLAIN: Why not adding a sequence or NA and specifics of modifications:

_____

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PROJECT NAME: _____DATE:_____

OTHER REQUIREMENTS For ALL PROJECTS

- OAT sensor and location check
- Limited Test and Balance activities with report on results and how tested:
  (The program does not pay for nor require a complete TAB)

  Required for all System Types & Projects:
  - ➢ Determine existing and required minimum OA ventilation (see PSE form).
  - ➢ Determine outside air minimum control damper position for required ventilation.
  - ➢ Building Pressure Check: verify building properly pressurized in all modes of operation.

  Required Depending on System Type & Project:
  - ☐ VAV Boxes or box controls replaced: balance/calibration of box flow rates; determine ventilation rates
  - ☐ Duct Static Reset: determine efficient minimum and maximum duct static setpoints
  - ☐ Differential Pressure Control for pumps: determine minimum possible differential pressure setpoint
  - ☐ _____
- Commissioning
  - ➢ Functional Performance Tests (provided by PSE)
  - ➢ Facility Guide (outline of elements required provided by PSE)
  - ➢ O&M/Staff training (based on Facility Guide)

RECOMMENDED OR ADDITIONAL: CONTROL/FEATURES

REQUIRED completion with one "add," if used to meet minimum of 3 sequences added or substantially modified.
Check boxes to show if existing or NA or if will be added or modified. Provide explanations at bottom.

Exists	Add	Modify	NA	General Description
				Monitor Based Commissioning (MBCx) – PSE preapproval
				Demand controlled ventilation (DCV) in exterior spaces (garage etc.) – hook to DDC
				Space temperature and ventilation setback based on occupancy
				Demand controlled ventilation (DCV) for kitchen hoods
				Demand Controlled Ventilation (DCV) for multi-zone spaces (with PSE approval)
				Door contacts/switches for mechanical system shut off
				Water-side economizer for chiller water plant
				Valves to isolate plant or heat pump equipment from pumping loop when not in use
				Differential pressure loop pump control: add VFD and 2-way valves
				Improved loop pump control: DP reset controls based on load
				Improved minimum outside air (OA) control: OA measuring station or DP sensors etc.
				Exterior heater occupancy controls: time switch or occupancy sensor
				Vestibule heating control: air curtain, heating shut-off and setpoint
				Improved cooling tower control: VFDs ramping controls, wetbulb control

ADDITIONAL SEQUENCES/FEATURES

EXPLANATIONS: