Facility:

Commissioning Provider: Date:

DIRECTIONS: Address each item listed or note why it was not tested/investigated. Add other items that were tested/investigated. Note what testing/investigation was done, how these were conducted and results of the testing/investigation. Indicate any operating parameters found. Put in EEI# for improvements to resolve items that are not optimal or explain why no improvements are recommended. Complete full EEI description and information in PSE NC Post Occ EEI Details form. Include other capital improvements that may be cost effective. Expand to fit information or note specific location of information. (Handwritten legible notes are acceptable.)

**SYSTEM TYPE: VAV BOXES (served by AHU ID #:\_\_\_\_\_\_\_\_\_)**

**EQUIPMENT & SEQUENCES INVESTIGATED** *(be specific)***:**

**Equip ID#s:** *Example: VAV – 1-13 though 25 sampled 10% (specifically: VAV 1-13, VAV-1-20, VAV-1-25)*

**Area Serves/occupancy type:** *Example: south side of building, offices Monday-Friday*

**Describe System:** *Example: VAV fan power boxes with electric reheat, parallel boxes*

**Sequences:** *Example: On/Off Schedule, Min/max cfm, night shut down/setback, room temperature reset*

**FINDINGS, TESTS and INVESTIGATION RESULTS:**

**Working Optimally?**

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **GENERAL SYSTEM CONDITION**: Equipment is generally in good shape and does not exhibit any abnormal nose or vibration. System is not in need of over-all replacement in the near future.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **SENSOR CALIBRATION & PT-to-PT**: Key controlling sensors (Examples: CFM, space temperature) are calibrated and in appropriate locations. Points are mapped correctly to the DDC front-end. Other sensor outputs seem reasonable.

Sensors Checked:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **PT-to-PT OTHER**: Other critical points (fan, damper, valve position, DAT etc.) are mapped correctly to the DDC front-end and reflect actual system condition.

Points Checked: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **SCHEDULING:** Operating schedule matches occupancy schedule including holidays. Equipment shuts down when unoccupied as evidenced by energy internal data or walk-through (night typically).

Schedule: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **OPTIMUM START/STOP – WARM-UP/COOL DOWN**: VAV box fans, (not AHU fan) are used for warm-up. Only VAV boxes in zones requiring heating or cooling are operating unless needed to prevent over-pressurization of ductwork. AHU is used for cool down in economizer mode with minimum boxes on. System is on as little as possible prior to occupancy to warm or cool down building.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **VENTILATION**: Individual zones respond to occupancy. Primary air damper is closed when the space is unoccupied.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **SPACE TEMPERATURES**: Space temperatures and setpoints are as efficient as possible – day, night setback, unoccupied, standby. Room temperature changes in response to occupancy into stand-by mode. Setpoints have proper deadband to prevent simultaneous heating and cooling. There are not comfort complaints from occupants.

Temperature Setpoints: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **ROOM THERMOSTATS:** Room thermostats are in appropriate locations and not influenced by non-room temperature heating or cooling elements (example: stat is right above a light) or blocked.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **NIGHT MODE & SETBACK**: VAV box dampers close, fans turn off and heat is off. Night walkthrough and early morning reveal nothing on unless needed. For night heating, AHU does not come on if VAV boxes have fans. Only VAV boxes with fans come on with primary air damper closed in zones where heating is required. If night heating or cooling is needed the minimum number of boxes come on.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **HW VALVES & DELTA T**: Valves are not leaking by and are opening and closing as needed. Temperature difference across coils heat is near design or appropriate indicating good heat transfer.

Appropriate delta T: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **ELETRIC REHEAT & DELTA T**: Electric heat is staging properly. No coils are stuck on. Temperature difference across strip heat is near design or appropriate indicating good heat transfer.

Appropriate delta T: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **DAT TEMPERATURE**: Discharge air temperature is resetting to minimize reheat. Air is distributed well and not causing comfort issues or system inefficiency. Discharge air temperature is not too hot to cause heat to accumulate on the ceiling and not too cold to cause the air to drop.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **DUCT WORK**: Duct work is not leaking air around diffusers and near boxes (into plenum for example). Boxes are not leaking air.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **OVERRIDES**: Controls, setpoints and equipment that can be easily overridden or circumvented are in normal/automatic operating mode. Examples – temperature setpoints, VAV box CFM, HW valve or electric heat.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **FANS**: VAV boxes fans with EC motors are ramping up and down efficiently to match load.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **CLEANINESS**: Filters and coils are clean and transferring heat efficiently.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **LOOP TUNING**: Loops are adequately tuned to prevent equipment breakdown and poor control.

Tests Conducted /Results/Findings:

**Yes No N/A EEI# \_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  [ ]  **INSULATION**: All HW pipes are adequately insulated. Insulation is around valves but with removable covers so it can be replaced easily after accessing valves.

Tests Conducted /Results/Findings:

**Yes No EEI#\_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  ***OTHER****: Describe other things tested/investigated.*

Tests Conducted /Results/Findings:

**Yes No EEI#\_\_\_\_\_\_\_ Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  ***OTHER:*** *Describe other things tested/investigated*

Tests Conducted /Results/Findings:

**CAPITAL EE IMPROVEMENTS**

**EEI# \_\_\_\_**  *Brief Description of Capital Improvement*

Notes/Comments:

**EEI# \_\_\_\_** *Brief Description of Capital Improvement*

Notes/Comments:

**TRAINING**

**Yes No Date(s)/time(s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

[ ]  [ ]  **Staff (occupants and O&M) fully understands how the system works.**

[ ]  [ ]  **Staff (occupants and O&M) fully understands how to run the systems efficiently.**

Specific Staff evaluated:

Comments:

**Specific Training needs of staff (occupants and O&M):**

**Ideas for Facility Guide/Operational Aides/Persistence:** What needs to be added (for example: sensors or specific trends, explanation on DDC graphic, or signage), provided (for example: table of VAV box CFM) or done (for example: putting check in maintenance schedule) to help the operators keep the systems operating efficiently over time?