Standing Meeting: GL-D and GS
September 15, 2021, 1300-1350

[Previous minutes]
Link to Discord

Attendees: Bass, Keene, Adham, Alsaid

Agenda

Midrar

- State project objectives for the ~next two weeks:
  - Simulate COP equation
  - Calculate change of temp in tank
  - Calculate change of EnergyTake
  - Model heating element and compressor thresholds
  - Outline HPWH source code
- The progress you've made since the last meeting
  - Reviewed EMCB report.
  - EnergyTake Calculations:
    - $\frac{8.35\ lbm}{\frac{1\ Gallon\ of\ water}{1\ ^\circ F}} = \frac{2.44\ Wh}{\frac{1\ Gallon\ of\ water}{1\ ^\circ F}}$
    - Same way Temp can be calculated:
      - If EnergyTake = 1400 Wh
        - 2.44 Wh * 50 gallon = 122 Wh/gal
        - 120F - (1400/122) = 108.5F << Avg tank Temperature
          - C - K
          - F - R Need to use Rankine in the above b/c 0 F <> 0 Thermal Energy
        - Leighton and Annie reported, Avg tank Temp $\approx$ Outlet Temp
    - Another way of calculating temp:
      - An x gallon of water draw occurred.
      - Inlet water (60 F) comes into the tank (120 F) (cold water gets mixed with hot water)
      - The final water temperature is y
      - $mass_{water} \times 120 - y \times C_p = mass_{water} \times y - 60 \times C_p$
        - [kgR] - [Wh/kg] units mismatched
        - Heat Transfer book (lab shelf)
      - Solving the above for y should give the final tank temp.
  - COP progress:

- COP = $\frac{rho \times C_p \times V \times (T_{outlet} - T_{ambient}) \times 0.294}{Input\ Energy} = \frac{Useful\ Energy\ (Wh)}{Net\ Energy\ (Wh)}$
- Rho = water density $\frac{lbm}{ft^3}$
- C_p = water specific heat $\frac{btu}{lbm.F}$
  - Cp is in F. So when calculating in Kelvin, convert Cp to K << Midrar's comment.
- V = volumetric flow rate $\frac{ft^3}{hr}$

When calculating the difference between two T's, can use F or C. << Dr. Bass

- What do you need to do next?
  - Finish EnergyTake, Tank_Temp, and COP calculations.
  - Validate EnergyTake and Tank_temp with EMCB data
  - Outline HPWH GLD source code
  - Compressor and heating element thresholds << shouldn't take much time. I already have results from EMCB testing so it's just coding.
- Technical questions for the team:
  -

Sean

- State project objectives for the ~next two weeks:
  - More work on the input branch
- The progress you've made since the last meeting
  - Documentation stuff, not gonna talk about that
  - Added three test DER-EMs
  - testlog demo for meeting sept 15 look at this link
  - So, the control doesn't work right, but IDK enough about what I'm looking at to figure out why or what it's actually doing, or even really what I did
- What do you need to do next?
  - Need more info
    - For starters, what is each column?
    - Take a look at blazegraph query (share screen)
    - See if we can get phase, bus, etc in the measurements via queries and the measurement processor
  - Continue building out the input handler and the log DER-S
    - Will make testing/troubleshooting a lot easier
  - Figure out how to get the batteries to do what I tell them to
  - Start end-of-phase-1 testing
- Technical questions for the team:
  - Non-specific help in understanding what I'm looking at; will be covered during discussion

Mohamm

- State project objectives for the ~next two weeks:
    - Wrap up code implementation
    - Wrap up documentation
    - Research how to publish the package
    - familiarize myself with DCM codebase
- The progress you've made since the last meeting
    - Working on the documentation part
        - Want to include description of what I did and why in the README & other markdown files in docs/
        - Aiming at making it a showcase for each component and it’s functionalities with examples.
    - Started the discussion about the control logic of the DCM with Blue
        - Created a state diagram for the DCM’s control logic (very high level)
- What do you need to do next?
    - Wrap up documentation
    - Get some pseudocode to represent the DCM control logic
    - Meet with Blue to discuss the logic further
- Technical questions for the team:
    - None