

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

[Previous minutes](#)

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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:
 - $\frac{8.35 \text{ lbm}}{1 \text{ Gallon of water}} = \frac{2.44 \text{ Wh}}{1 \text{ Gallon of water}}$
 - Same way Temp can be calculated:
 - If EnergyTake = 1400 Wh
 - $2.44 \text{ Wh} * 50 \text{ gallon} = 122 \text{ Wh/gal}$
 - $120\text{F} - (1400/122) = 108.5\text{F} \ll \text{Avg tank Temperature}$
 - 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:

- $$\text{COP} = \frac{\rho \times C_p \times V \times (T_{\text{outlet}} - T_{\text{ambient}}) \times 0.294}{\text{Input Energy}} = \frac{\text{Useful Energy (Wh)}}{\text{Net Energy (Wh)}}$$
- $\rho = \text{water density } \frac{\text{lbm}}{\text{ft}^3}$
- $C_p = \text{water specific heat } \frac{\text{btu}}{\text{lbm.F}}$
 - Cp is in F
- $V = \text{volumetric flow rate } \frac{\text{ft}^3}{\text{hr}}$

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

- 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