Minutes for Team HEV Weekly Meeting with Professor Schafer, 1/25/2010:

1. Action Items - Worked this week

a. Made calculations on voltages and currents

-Schafer doesn't think the internal resistance (~0.4 ohms) to be too high, but Bauer thinks it might be

b. Ultra-capacitor balancing circuit, with power diodes

-Siyuan to get Schafer the order form

-power diodes must be able handle the current, will require heat sinks

c. Building the MOSFET circuits for microcontroller switching

-p-MOSFETS ordered, arrived on Thursday

-circuit built on breadboard, tested, and validated

d. Moving to Stenson-Remick

-Natalie confirmed that we can work in the loading dock

-necessary equipment for capacitor testing in S.R. => will be able to move everything to S.R.

2. Action Items - Need to do

a. Connections (Slipstream is providing us with robust wires)

-discussed/decided to forego using the outlets provided on the generator

-will instead tap into the "hot" wire directly for ONE connection, will require a larger fuse

-will find the right wire gauge to handle ~70 A (probably around 4 G)

b. Replace 3 kW transformer with 6 kW transformer (Also provided by slipstream)

c. Test the balancing circuit

d. Microcontroller board design

-current sensors should be interfaced to the board, but not lie on it

-add MOSFET circuit to board design

-GPS interface

e. Begin Low Level Design

f. Globe plugs

- figure out how to handle warming up globe plugs before starting generator in the cold (not an issue for us during normal testing, but would create issues in real-world scenario with truck running in Chicago winters)

3. Subsystems to be Demonstrated

a. Charging Circuitry

I. Generator

II. Transformer

III. Bridge Rectifiers

b. Microcontroller switching given input from ultra-capacitor stack

I. Hardware: resistor divider circuit

II. Software: C Programming

i. Send "on" signal when stack voltage reaches a low threshold

ii. Send "off" signal when stack voltage reaches a high threshold

iii. More complex algorithms when GPS receiver is fully configured

c. Microcontroller interface with Current sensors

I. Hardware: Current sensors that outputs a small voltage proportional to current measured

II. Software: Use current sensors to determine how long to leave the starter motor on

d. Microcontroller interface with GPS receiver and SD card