May1727

Project Title: Stand-alone Hybrid Solar/Wind Power Plant

Advisors: Dr. Venkataramana Ajjarapu & Ankit Singhal

Team Member – Roles

Nathaniel Byrne - Group Leader

Brian Gronseth - Solar Tech. lead

Jeffrey Szostak - Wind Tech. Lead

Matthew Lee - Communications Lead

Mike Trischan - Key Concept Holder

Eric Cole - WebMaster

Executive Summary:

Began writing modular lab experiments in order to create a bank of possible experiments to choose from when writing the final Lab Manual. We need to finish writing all the software experiments we can so we can pass those onto our Sister Design group ASAP.

Past Week Accomplishments:

Changed the parameters of the generator so the output is now sinusoidal.
This week, the group looked over the solar panel sensors and concluded that we need a new irradiance meter because the old one is broken. We're currently looking into pricing because if we were to purchase the current model (which is broken), that would cost several hundred dollars. In terms of Wind, the team found out the phase to phase resistance and phase to phase inductance of the generator we're using. We also worked on the labs for both the solar and wind.
Took more measurements in solar equipment, researched irradiance measuring devices. Worked on testing wind turbine. Met with sister senior design group
Solar was limited in compleating this weeks measurments due to the inverter reset. We began analysis of the lab we would write for the class. Wind I forgot.
Solar team created an experiment bank and lab documents based off of some of the experiments for EE452 students to eventually perform.
Fixed the generator output waveforms by changing the base torque of the machine. Found the input and output power of the wind model. Wrote a lab walking students through why we and how we are using AC-DC-AC power conversions.
This week, the group worked on our Senior Design presentation which we're presenting 3-Mar-2017. We also made minor updates to the hardware and software as well as made minor updates to the Simulink files.

Individual Contributions:

Worked with Pranav on Simulink model.
The advisor meeting this week was postponed because three of the six members were unable to attend due to unforeseen circumstances (two last minute interviews and a family emergency).
Discussed past accomplishments and future goals
Our meeting was brief with Pranav as Ajjarapu was out of town.
Discussed the goals and purpose of the lab documents and how to make the software and hardware labs work together.
Went well.

I was unable to attend the advisor meeting. For most of the meeting, the Solar aspect of the project was discussed.
Still wants to see our simulations. Apparently everything we showed him last semester and everything we've shown him this semester still isn't good enough!

Summary of Weekly Advisor Meeting:

Worked with Pranav on Simulink model.
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Plan for Next Week:

Understand and calibrate output of the system.
Finish the two lab reports, purchase a new irradiance meter, run more tests on the wind generator (and possibly set it up if the ground has thawed).
Work on testing turbine, create lab docs, work on solar hardware and make sure we are familiar with interface
We will produce modular labs.
Create interchangeable labs and find where the power losses are occurring in the solar hardware. Also looking into the power generation and consumption in the software system.
Add batteries to the wind simulation and measure power at all critical points within the simulation to see where power loss is happening.
Finish the Senior Design presentation as well as acquire the remaining wind turbine parameters. We now have the correct coupler which has been properly threaded so we are now able to run the tests.
Give the man what he wants.

Pending Issues:

Understanding the way simulink models different blocks.
Lack of knowledge in regards to wind turbine testing has proven to be a difficult challenge to overcome and has resulted in not receiving the data on time.
The wind turbine testing is proving to be a lot more work than anticipated. Between the theory (such as understanding dq axis) and methodology (such as energizing the dq axis to measure voltage and current to find inductance), Jeff and I have put in a serious amount of work with very little to show for. From our adviser's viewpoint, our task is to get parameters for the turbine. All we have to show, so fa,r is phase-phase resistance and inductance. We've put almost 30 hours of work into this, yet, to our adviser, it looks as if we did very little.
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Na
na
None.
Understanding what Ajjarapu wants. I will be trying to go to office hours.

Comments/Extended Discussion:

None
None
None
None
None
None
None
None