EE 492 Bi-Weekly Report

March 1 - March 15

SDMAY21-46

Microgrids to Support Communication Infrastructure

Client/Advisor: Dr. Anne Kimber

Team Members: Dylan Miley, Liam McAlister, Ryley Radack, Abdelrahman Mannan, Hoang Dang

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Weekly Summary

Over the past two weeks, the team completed the simulation of the microgrid containing batteries, hydrogen system, wind turbine system, PV arrays, and inverters. The simulation settles so that each generation component is providing power to the load. Some reactive power is also being created, which is not ideal, but fixing this issue is not a high priority due to the need to begin working on the nanogrid.
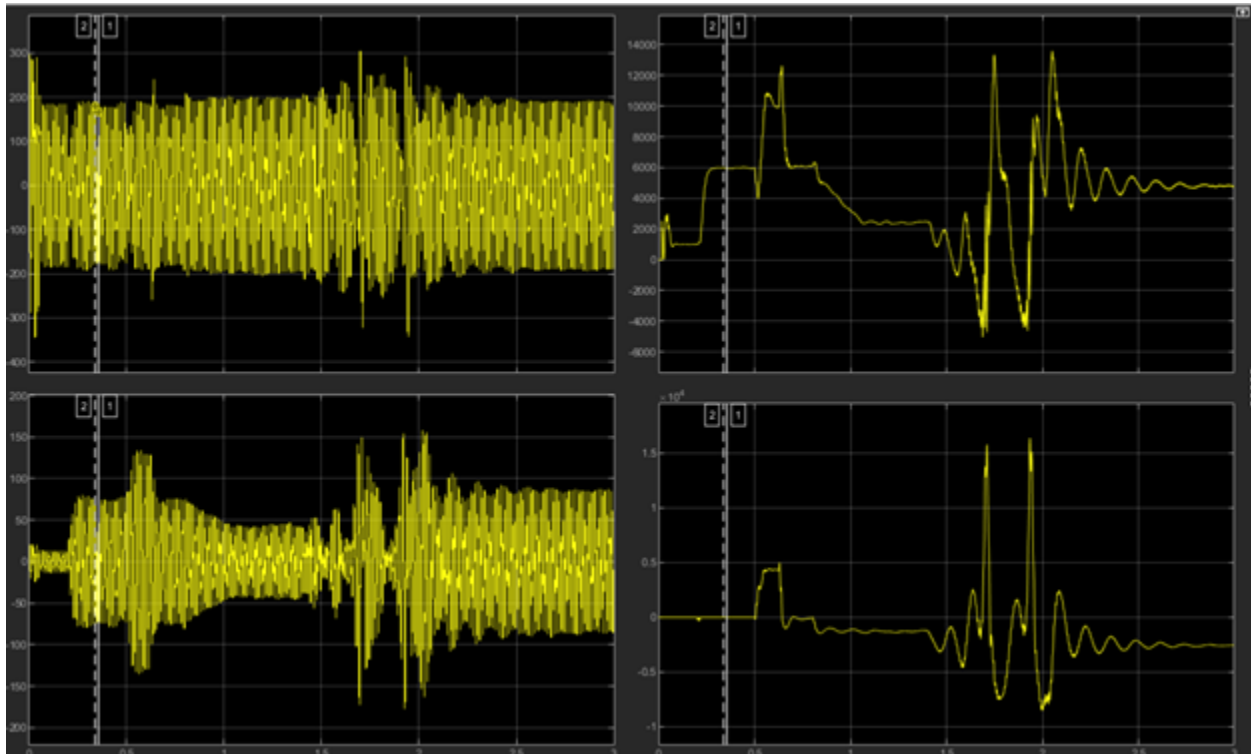
This graph shows the voltage (top left), current (bottom left), real power (top right), and reactive power (lower left). The transients seen occur when new generation sources and new loads are introduced into the system. As can be seen, eventually the system stabilizes.

Past Week Accomplishments

- Completed the integration of simulation components to create one single simulation.

Pending Issues

- Need to create a report detailing the simulation components, sequence, and variables.
- Need to begin building and testing the prototype nanogrid.

Individual Contributions

Team Member	Individual Contributions	Hours This Time Period	Cumulative Hours
Liam McAlister	- Troubleshot grid-following inverter model	~21	~65
Dylan Miley	- troubleshot hydrogen inverter model	~12	~58
Hoang Dang	- troubleshooting integrated model	~20	~64
Abdelrahman Mannan	-Worked on integrating PV system with Battery and inverter	~12	~54
Ryley Radack	- Modified inverter for wind subsystem - Troubleshot Batter + Wind subsystem models	~13	~60

Plans for the Upcoming Week
Liam   - Begin writing the report, focusing primarily on grid-following inverter components
Dylan   - Complete integration of hydrogen inverter
           - start integration of hydrogen+inverter with the rest of microgrid
Hoang - resizing the models so that wind turbine produce power, or increase the load.
           - writing reports of different iterations of battery model
Ryley   - Finalize wind inverter controls
           - Set up data logger for use with nanogrid components
Abdel   - Integrate PV array with system
              -    Generate signal using NREL data
              -    Set up data logging for nano grid solar and battery system
              -    Begin writing pv array portion of the document
Entire team   - Write up report
              - Begin testing PV array, battery, and hydrogen fuel cell for nanogrid

Summary of Weekly Advisor Meeting
- Reported on the completed simulation
- Made plans for writing the simulation report
- Made plans for testing PV array, battery, and fuel cell