sdmay19-46: Impact of High Photovoltaic Penetration on Distribution Systems
Advisor: Dr. Ajjarapu
Week 5 Report
October 4 - October 12

Team Members
Daniel Tott - Team Leader
Nathan McGlaughlin - Webmaster
Jasleen Grover - Key Concept Holder 1
Minsung Jang - Key Concept Holder 2

Summary of Progress this Report
We attempted to apply a voltage regulator into our 4 node distribution system. It didn't work, as there was confusion as to the placement of the voltage regulator meaning the transmitter, or the actual part on the transformer. We also implemented the majority of the 4 node distribution system in GridLAB-D.

Past Week Accomplishments
Everyone:
- Researched Voltage Regulators
  - Studied voltage regulators, and how they work with transformers in distributions systems.
  - Gained an understanding of the difference between a voltage regulator, and the actual part on the transformer.

- Attempted Implementation of Voltage Regulator in 4 Node Distribution System
  - Applied a voltage regulator to the load side of the 4 node distribution system, and saw its effect.
  - Solution was incorrect, as the voltage regulator was applied in the wrong part of the 4 node system.

- Began Implementing the 4 Node Distribution System in GridLAB-D
  - Defined the nodes, load, transformer, transformer configuration, and the lines of the 4 node distribution system in GridLAB-D.
  - Power flow didn't work correctly, as there was errors with the definition of line configurations.

Pending Issues
Everyone:
- Need to adjust the application of the voltage regulator in our 4 node distribution system.
- Find how to define the line configurations of our 4 node distribution system in GridLAB-D

Plans for Upcoming Reporting Period
Everyone:
- Complete 4 Node Distribution System with Voltage Regulator
  - Find the equivalent phase impedance between node 3 and 4 with the repositioning of the voltage regulator.
  - Calculate the compensator currents with the voltage regulator.
  - Run forward and backward sweeps using MATLAB to solve the power flow of the 4 node distribution with the voltage regulator.

- Finish 4 Node Distribution System in GridLAB-D
  - Define the appropriate values for the line configurations of the distribution system.
  - Run power flow simulation, and compare results to the previous verified solution.
  - Make alterations to the code if necessary.

Individual Contributions

Team Member	Contributions	Weekly Hours	Total Hours
Daniel Tott	-Researched more about voltage regulators, especially how they could be used in our simple 4 node system. -Tried to add a voltage regulator to our 4 node system. -Wrote a skeleton of our code for our 4 node system in GridLAB-D, and got comfortable with the objects needed for our 4 node system.	7	42
Nathan McGlaughlin	-Researched voltage regulators. -Worked on getting the current for the voltage regulator.	6	38
Jasleen Grover	-Learned how to use voltage regulators. -Helped with getting the voltage regulator to work in our 4 bus system. -Researched how to code in GridLab D.	7	37
Minsung Jang	-Read in the textbook about voltage regulators. -Worked on the Matlab code to get the voltage regulator to work. -Researched the Grid Lab D program.	6	31

Gitlab Activity Summary

- Nothing to report.