sdmay19-46: Impact of High Photovoltaic Penetration on Distribution Systems
Advisor: Dr. Ajjarapu
Week 3 Report
September 21 - September 28

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

In the past week we finished the IEEE 4 bus system by hand. Through setting the generator node to a constant, we were able to get a more stable convergence that gave correct values for the power flow. We presented our findings to our professor, and found that we were able to go through the entirety of the power flow correctly this time.

Past Week Accomplishments

Everyone:
- Solved the IEEE 4 bus system's power flow.
  - We again computed the first iteration of the power flow together by hand, except we kept node 1, which is the generator at a constant 7.2 kV, as we know this is constantly going to be provided.
  - Made adjustments to the MATLAB code to set node 1 as a constant, and computed the rest of the iterations as we did before.
  - Saw that the power flow was converging correctly, and after seven iterations, our values for the node voltages and the line currents were the same that IEEE had previously found.

- Explained our findings to our advisor.
  - Showed our values for the power flow to our advisor, and how they compared to IEEE's findings.
  - Explained the steps that we took through the power flow, and where we made corrections to our previous method.

Pending Issues

Everyone:
- None

Plans for Upcoming Reporting Period

Everyone:
- Research how to use voltage regulators.
  - We are going to add a voltage regulator to the 4 node system that we had previously solved by hand. All of this will be done in MATLAB this time, and we will need to understand how to use voltage regulators in order to do this.

- Learn how to use GridLAB-D.
  - We are going to start using GridLAB-D, an open-source software for modeling distribution systems, to model our distribution system from now on.
  - Need to learn how GridLAB-D works, and how we would implement our 4 node system in GridLAB-D.

Individual Contributions

Team Member	Contributions	Weekly Hours	Total Hours
Daniel Tott	Did research on distribution systems, and solved problems relating to distribution systems. Problems were solved from the textbook. Most of the work was on solving a power flow for IEEE's 4 node test distribution system. This work was done by hand, and most of the computation was through MATLAB.	8	28
Nathan McGlaughlin	This week I solved the IEEE 4 bus system by hand.	8	28
Jasleen Grover	Solved the 4 bus systems. Did the assigned reading given by the advisor.	8	25
Minsung Jang	I struggled to solve IEEE 4 bus system, and to understand overall power flow system in order to set a basis for our project.	7	20

Gitlab Activity Summary

Gitlab Report

- Nothing to report.