

sdmay19-46: Impact of High Photovoltaic Penetration on Distribution Systems

Advisor: Dr. Ajjarapu

Week 10 Report

November 7 - November 14

Team Members

Daniel Tott - Team Leader

Nathan McGlaughlin - Webmaster

Jasleen Grover - Key Concept Holder 1

Minsung Jang - Key Concept Holder 2

NOTE : Everyone in the group was asked to prepare an individual presentation for the advisor. In this report everyone will be reporting that as their individual contribution.

Summary of Progress this Report

Did the presentations

Started on coding in matlab to put the system in GridLab D through Matlab

Past Week Accomplishments

Daniel:

- Created a presentation for our advisor to show what I've done this semester.
 - Made a powerpoint that started with showing the relevant information from what I've researched with the duck curve, solar energy, and distribution systems. Then went through the 4 node distribution system by hand, and went through our difficulties that culminated with the thorough understanding of the system. Showed the calculations that were used in MATLAB for the iterations of the power flow for the 4 node distribution system. Then showed my understanding of voltage regulators in that they make adjustments to a transformer in order to get a certain voltage further down the system, and how we added it to our 4 node distribution system. Then went into my basic understanding of how GridLAB-D works, and the basics of the main objects that are needed for the powerflow module. Gave a basic walkthrough of how we designed our 4 node test feeder in GridLAB-D. Then moved on to the 13 node distributions system, and discussed the additional components that needed to be considered with the larger system, and how it works when it isn't a linear system. Talked about how the capacitors in the 13 node system raised the voltage where necessary, and the voltage regulator lowered the voltage in this instance. Then discussed the future distribution systems that we'd be working on.
 - Presented this powerpoint to our advisor, Dr. Ajjarapu, in a 5 minute presentation and answered questions that he had.
- Looked into how we could use MATLAB to write code for IEEE's 34 node test feeder in GridLab.
 - Reviewed for loops, and how they could be used to go through a spreadsheet and extrapolate data that could then be written in GridLAB-D's format.
 - Researched previous instances where people have used a program to take distribution system

data and write into a certain coding language.

Nathan:

- Created a presentation
 - Worked on a presentation for our advisor about what we had accomplished this week
- Studied 34 Node Test Feeder
 - Looked into the 34 node test feeder to prepare to implement it in GridLab

Jasleen:

- Made presentation for the advisor. This presentation included our simulation results and our research outcomes.
- Started looking at the Solar PV penetration and the IEEE 34 bus system. I started researching and understanding how to add the effect of the solar PV on our present system (13 bus)

- **Minsung:**

- Created a presentation
 - Made a presentation to show what we have done in this semester. I Introduced duck curve, Distribution system and 4 node hand calculation, matlab materials and GridLab D results. Also, I showed 13 node bus system and its results which depends on the presence of Capacitor and Regulator.

Pending Issues

None

Plans for Upcoming Reporting Period

Everyone:

- Learn more about writing code that could write distribution system data in GridLAB-D.
 - Talked with our advisor and it was agreed that we wouldn't be constructing any more distribution systems in GridLAB-D with the semester nearly over. Our task is to learn about coding in MATLAB to take distribution system data from a spreadsheet and convert into code for GridLAB-D.
 - Research instances where other people have used programming languages like C, Python, or MATLAB to write distribution system data into a different language, preferably GridLAB-D.
 - We will agree upon a certain format for GridLAB-D, and work on how to write MATLAB code for different GridLAB-D objects.

Individual Contributions

Team Member	Contributions	Weekly Hours	Total Hours
Daniel Tott	-Created a presentation for our advisor to	6	74

	show what I've done this semester. -Looked into how we could use MATLAB to write code for IEEE's 34 node test feeder in GridLab.		
Nathan McGlaughlin	Created a presentation for our advisor to show what I've done and learned throughout the semester. Studied 34 node system	6	70
Jasleen Grover	- Created a presentation for Dr. Ajarapu to show the progress in our project till date . -Started looking in the PV penetration effects	6	70
Minsung Jang	-Created a presentation that we have done in this semester, 4 node and 13 node bus system.	6	63

Gitlab Activity Summary

Gitlab Report

- Nothing to report.