sdmay19-46: Impact of High Photovoltaic Penetration on Distribution Systems
Advisor: Dr. Ajjarapu
Week 9 Report
October 31 - November 7

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

Made corrections to the code for IEEE's 13 node test feeder 13node.glm. The corrections allowed for the voltage regulator to run properly, and accurate voltages and currents for the nodes and lines were extracted from GridLab. We ran 13node.glm with both the voltage regulator and capacitors active, and then removed one of each, and then removed both, and compared the voltage profiles. Also made corrections to 4node.glm to correctly define the voltage regulator that was added to the system in GridLab last week.

Past Week Accomplishments

Daniel:
- Corrected the clock for 13node.glm
  - Redefined the object for the clock to allow the clock to run for 60 seconds instead of just a snapshot of the power flow. The running clock allowed for the voltage regulator to make the necessary voltage adjustments over a period of 30 seconds.
- Made document showing difference with/without capacitors and voltage regulator
  - Needed to identify the differences that adding/removing the capacitors and voltage regulator would make. Ran the power flow for 13node.glm with both the voltage regulator and capacitors active, with only the voltage regulator active, only the capacitors active, and then neither active. Found that the capacitor was boosting the voltages in the branches that they were in, as expected, and the voltage regulator was regulating the voltage after the transformer to be lower.

Nathan:
- Simulated 13 Node System
  - Simulated 13 Node system with both regulators and capacitors in. Analyzed the results from the simulation.
- Analyzed results from Daniel's document
  - Noted the effects voltage regulators and capacitors individually had on the system.

Jasleen:
- Simulated the 13 node system with putting a capacitor on the load.

- Did coding to improve the result of the 13 bus system of the assigned part

Minsung:
- Prepared presentation what we did so far
    - Simulate 4 node and 13 node bus system
    - Remind concepts, capacitor and regulator, that I need to refer in presentation.
    - Analyzed Daniel's document that we need to add on presentation.

Pending Issues
None

Plans for Upcoming Reporting Period

Everyone:
- Get ready for presentation with Dr. Ajjarapu
    - All making separate presentations detailing what we learned/achieved this semester. We plan to meet to discuss what we feel should go into our presentations, and then will create them separately so as to show where we are all at with the project.

Individual Contributions

Team Member	Contributions	Weekly Hours	Total Hours
Daniel Tott	-Corrected the clock for 13node.glm -Made document showing difference with/without capacitors and voltage regulator	5	68
Nathan McGlaughlin	-Simulated 13 Node system -Studied the effects of capacitors and voltage regulator on system	5	63
Jasleen Grover	- - Corrected the 13 bus system - learned new syntax for GridLab	5	64
Minsung Jang	- Simulate 4bus and 13 node bus systems - Studied capacitor and regulator on the system	5	57

Gitlab Activity Summary
- Updated 13node.glm to include clock that runs for one hour.

- Created 4 versions of 13node.glm: 13node.glm with both capacitors and voltage regulator active, 13nodeNoC.glm with no capacitor, 13nodeNoVR.glm with no voltage regulator, and 13nodeNeither.glm with neither the capacitors nor voltage regulator working.