BiWeekly Summary

During this time period we worked on writing scripts that will monitor all nodes within the system and output them in a readable fashion in MATLAB. This puts us close to finishing all required scripts to fully model the 34-node network and all pertinent data. Also, we worked on using MATLAB to update the OpenDSS model using the MATLAB COM interface. Finally, we set up a Git repository so that we can instantly share our program updates with each other without having to send emails.

Past biweek accomplishments

- o Continued writing scripts in MATLAB so that OpenDSS can be run in its COM interface, allowing us to simulate multiple different configurations on the same system much more efficiently.
- o Wrote and implemented a script to create distributed solar into the 34-node network to see how voltage levels change with respect to the % of load covered by it.

Pending issues

- o Make contact with Alliant Energy. Obtain their network specifications and start work on simulation and design.

Individual contributions

Name	Individual Contributions	Hours this Session	Hours cumulative
Daniel	Began research on cost projections for certain components concerning our optimization problem for injecting solar	12	32
Andrew	Scripts for injecting distributed solar into the 34-node network Scripts for running OpenDSS via COM through MATLAB	14	38
Kenneth	Researched how to make .dss files compatible with MATLAB so OpenDSS may be run via COM	12	34
Thomas	Scripts for reading the output data and determining any out of specification data points	13	35

Plans for the upcoming week
- Meet on Monday 3/2 at 1 PM with Dr. Ajjarapu to document our progress and determine our plan forward with working on Alliant Energy's system.
- Develop optimization plan to determine how to best implement large scale solar into the 34-node network.
    - Continue researching costs associated with critical points of solar implementation.
- Finish writing scripts for MATLAB modeling the 34-node network.
    - Spot-load solar injection
    - Finish MATLAB COM script for remotely running OpenDSS

Summary of weekly advisor meeting
- General Advice
    - Show figures using percentage of total load rather than percentage of distributed load
    - Can the substation be reduced below 1.05 p.u. voltage and have solar power compensate for it?

- o Implement temperature dependence to load (possibility)
- o Implement storage into our model (possibility)
- o Look at papers on Optimal Sitting and Sizing of DG systems
- o Optimization
  - o Should we use community solar and restrict locations or should we let customer install distributed solar and not restrict locations?
  - o What is the best optimization method to use here? Analyze possible methods
  - o How do we estimate costs for parts?
  - o How do we calculate loss for these different methods?
- o Conditions for Optimization
  - o Find the minimum solar capacity needed to provide adequate regulation (potential optimization statement)
  - o Find a specific optimization equation/method
  - o We can model tap changes of voltage regulators as a cost for optimization.