
EE 491 Weekly Report 3

2/6/18 – 2/13/18

Group 11

High-Level Design of a Distribution Microgrid

Client: Alliant Energy

Advisor: James McCalley

Nick Stitzell – Communications Engineer

Minoru Fernando – Power Engineer

Joe Thurin – Power Engineer

Taylor Murphy – Research Engineer

Remo Panella – Data Engineer

Project Objective:

Create an excel document that estimates the cost of incorporating distributive generation and storage into a microgrid system at Nichols, IA.

Weekly Summary:

This week our team made progress on our first prototype for modeling the microgrid of Nichols. We started by deciding what our variable inputs and outputs will be, then researched for more information on the solar radiation and weather conditions in Nichols. We hit a roadblock midway through the week due to confusion in our team regarding the scope of our project, so during our client meeting we finalized the scope of our design and who will be responsible for what.

Past Week Accomplishments:

- Gathered important information and spec sheets for Nichols, IA
- Changed team roles
 - Got rid of the economics engineer position and created another power engineer position

Pending Issues:

- Uploading material to course website

Individual Contributions:

Team Member	Contribution	Weekly Hours	Total Hours
Nick Stitzell	Finalized project plan, planned for the next week, organized client meeting	3.5	10.5
Minoru Fernando	Researched tools for calculating solar radiance based on coordinates, researched worst case scenarios for monthly solar radiation in Iowa.	3	3
Joe Thurin	Assisted with organizing client meeting,	3	6
Taylor Murphy	Researched cloudy days affecting the system and estimated the amount of panels needed for peak demand	3	5
Remo Panella	Assessed current scope, created input/output list, began prototyping spreadsheet	3	4.5

Plans for the Coming Week (2/6/18 – 2/13/18):

- Finalize project scope
- Nick
 - Learn how to upload information to project website
 - upload weekly report, project plan
 - Finalize project plan
- Remo
 - Finalize list of input/output information
 - Create a chart to show the progress of our team
- Joe
 - Look over client solar and battery specs sent out after meeting
- Taylor
 - Begin designing a rough draft of supplemental and backup power systems

- Minoru
 - Research more examples of similar microgrid designs
 - Research designs that combine solar and battery

Summary of Client Meeting (2/13/18):

- Use costs of solar/watt and Lithium battery to estimate construction costs with spreadsheet
 - Backup generation costs may be removed
 - Costs will be sent to us via email
- Would the cost of making Nichols into an island system be less than building a new radial transmission line to Nichols?
- Darin will ask to see if our scope will include customer costs and the initial cost compared to changing costs over time
- Goal is to show how the current microgrid would be designed, not how to design a microgrid in general
 - Just assess investment cost of microgrid installation in Nichols
- Backup generation is costly, so minimize usage
 - What's the longest time we would go without solar generation and would need another fuel source to cover customer demand?
- Our team should research the reliability
 - Solar panel and inverter power system with underground cabling to customers
 - Solar panels have 20 year warranty, 10 year warranty for batteries
 - Specs will be found by Darin and Logan
- Hoping that Nichols could be entirely self-sufficient and able to operate on all generation
 - "ideal island"
- Solar panels will be stationary
- Include hours of operation the system can go without generation as an output