EE 492 Bi-Weekly Report 1 - sddec18-03

Design of a More Reliable Power Grid for Puerto Rico

8/27/18 - 9/10/18

Faculty Advisor: Vikram Dalal

Team Members

Logan Lillis - *Communications and Reports Lead*
Ricardo Rodriguez-Menas - *Webmaster and Project Plan Lead*
Heiqal Zamri - *Test Engineer Lead*
Pinjia Zhang - *Design Lead*

Weekly Summary

After our first senior design class meeting on August 23rd, we met as a group in the TLA to discuss our progress last semester and formulate our goals and plan for the coming semester. We were able to work with our newest group member, Pinjia, to develop roles and responsibilities for the semester. Meeting times for both our group meetings and meetings with Professor Dalal were determined. After meeting with Professor Dalal, the team was tasked with researching updated publications on Puerto Rico's grid and working towards a plan with three main technical components: storage, using natural gas versus coal, and using distributed generation and microgrids.

Past Week Accomplishments

- Formulated Roles for new 4-person team
  - Logan Lillis - *Communications and Reports Lead*
  - Ricardo Rodriguez-Menas - *Webmaster and Project Plan Lead*
  - Heiqal Zamri - *Test Engineer Lead*
  - Pinjia Zhang - *Design Lead*
- Created goals for the semester
  - Determine a program to simulate load flow and transmission design
    - To be headed by Pinjia
- Determined the main focus areas of this semester to continue to focus design on
  - Energy Storage
    - Amount required, cost associated
  - Natural Gas
    - Versus coal? Efficiency, cost, availability, etc.

- ➢ Distributed Generation and Microgrids
  - ■ Distributed renewables, oil, and gas
- ➢ Economic Proposal
  - ■ Continuation of EE 491

Pending Issues

- ❖ Need to determine a software capable of modeling load flows and microgrids
  - ➢ Pinjia will work with power professors
- ❖ Need to begin writing paper/deliverable

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours

Logan Lillis	• Researched most recent DOE Report on Puerto Rico Redesign.
	  ○ https://www.energy.gov/sites/prod/files/2018/06/f53/DOE%20Report_Energy%20Resilience%20Solutions%20for%20the%20PR%20Grid%20Final%20June%202018.pdf
	  ○ 5 main recommendations, and 4 main research areas. Transmission and Distribution will be the main focus for our project
	• Decreasing load over time
	  ○ People are moving off island. Load in future could be supplied by as little as 3 power plants by 2026
	• Transmission and Distribution
	  ○ Monopole installation
	  ■ Cost-effective wood alternatives
	  ■ Designed for 150mph winds
	  ○ 230/115kV
	  ○ Vegetation removal plan
	• Microgrids:
	  ○ DOE recommends segmenting transmission into smaller segments and adding distributed generation.
		2.5	2.5

	• Natural Gas
	  ○ One existing terminal
	  ○ Pipelines in past have been denied, but possible location for one recommended in report.
	  ○ Import from US over Trinidad and Tobago
	• Renewables
	  ○ 20% Renewable by 2035
	• The report also has an appendix of each agency's overview of the current plan. Very helpful.
	• Write Status Report #1		

Ricardo Rodriguez-Menas	• Attended group weekly meeting with Professor Dalal	0.5	0.5
Heiqal Zamri	• Researched revision of interconnections to connect multiple power grids together. ○ Berkley Microgrids • Attended group weekly meeting with Professor Dalal	2	2
Pinjia Zhang	• Study EE 491 final presentation and proposal material to become familiar with project • Attended group weekly meeting with Professor Dalal • Began focusing on how to implement the data	2	2

Plan for Upcoming Week

- ❖ Research PSEE/Other power software applications. Meet with Professor McCalley
  - ➢ Pinjia will head.
- ❖ Begin Powerpoint for EE 492 Class Meeting on 9/20