

EE/CprE/SE 492 WEEKLY REPORT 5

Start Date – End Date: 4/07-4/21

Group number: 27

Project title: 60 MW Solar Field and 34.5/115 kV Substation Design

Client &/Advisor: Black & Veatch advised by Ajarapu

Team Members/Role: Omer Karar, Madison Lakomek, Madissen Lawrence, Jacob Miller, Brooke Nelson, Ashton Randolph, Jenna Runge, Zachary Zimmerman

Weekly Summary

In the past two weeks, calculations, drawings, as well as ETAP simulation were mostly finalized. The three line diagram as well as the conduit plan was completed based on the key and one line diagrams. AC calculations were completed and approved by Black & Veatch as well as the lightning calculations. Etap simulations were run and arc flash, short circuit, and load flow studies were successfully completed.

Past week accomplishments

- ETAP - Zach and Asthon
 - Completed arch flash, short circuit, and load flow studies
 - Generated short circuit and load flow reports
- Lightning Calculations - Jacob and Omer
 - Used empirical method to calculate appropriate height of lightning masts to provide overlap protection across all substation components, position pending.
- Conduit Plan - Maddy and Brooke
 - Updated conduit plan by making the trench at 45 degree angles instead of 90 degree angles to minimize the amount of trench needed
 - Adding PVC piping onto diagram
 - Added labels to demonstrate the conductor type, size, and amount as well as the size of the PVC pipe needed
- Three line diagram - Maddy Lakomek
 - Began the three line based off the previously made one line diagram
 - Connected all CTs to fully complete the three line
- AC Load Calculations - Jenna, Madissen, Brooke
 - Finalized the AC load calcs and got B&V approval.

Pending issues

We need to begin working on the final document, final presentation, as well as the virtual poster. All aspects of the design work are mostly complete, so the final steps are to put it all together in the final document and presentation.

Individual contributions

**this should be short and concise based on past week accomplishments. Instructions say do not include group meetings*

Name	Individual Contribution	Hours in the Past 2 Weeks	Hours Cumulative
Omer Karar	Continue working on lighting, and the deliverable for the final presentation.	8	30
Madison Lakomek	Conduit plan drawing and three line diagram	12	43
Madissen Lawrence	Finished the AC load calcs, updated the website, started the deliverables for the final assignment. Recorded meeting minutes for 4/12.	9	45
Brooke Nelson	Finished the AC load calculations, worked on the conduit plan drawing.	6	31
Jacob Miller	Finalized lightning mast height working toward final placement. Led 4/19/23 meeting	6	39
Ashton Randolph	Altered the ETAP layout to successfully run the arch flash, load flow, and short circuit studies. Generated accurate load flow and short circuit reports	11	42
Jenna Runge	Lead 4/12 meeting with B&V, started and finished AC Load calculations, started deliverables for final assignment	11	44
Zachary Zimmerman	Altered the ETAP layout to successfully run the arch flash,	11	41

	load flow, and short circuit studies. Generated accurate load flow and short circuit reports and completed the ETAP portion of the project.		
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Plans for the upcoming week

(Please describe duties for the upcoming week for each member. What is(are) the task(s), Who will contribute to it? Be as concise as possible.)

- Omer Karar-** Complete the lightning, and work now on the final presentation.
- Madison Lakomek-** Completely finalize the three line diagram and begin working on the design document, presentation, and poster
- Madissen Lawrence-** I will be working on the final report, poster, demo, and presentation.
- Brooke Nelson-** I will be working on the final presentation, poster, demo, and design document.
- Jacob Miller-** Finalize placement of lightning masts so as not to interfere with existing key plan, transition personal contributions to final report, presentation and poster.
- Ashton Randolph-** I will be working on the final presentation, poster, demo and design document.
- Jenna Runge-** I will continue working on the final design document, and start working on the poster, demo, and presentation.
- Zachary Zimmerman -** I will begin working on the final design report, poster, demo, and presentation.

Summary of weekly advisor meeting

The meeting on 04/13:
 Discussion of ETAP progress. Discussion of general integration of the substation, PV farm, and transmission to check our understanding.

The meeting 04/20:
 Ajjarapu was gone so we just met as a group to discuss our game plan for completing our final report, presentation, and poster.