

sdmay23-27: 115kV/34.5kV Solar Power Plant & Substation Design Project

Week 4 Report

October 14 - October 21

Team MembersMadison Lakomek — *Leader*Brooke Nelson — *Researcher*Ashton Randolph — *Researcher*Jacob Miller — *Researcher*Jenna Runge — *Researcher*Madissen Lawrence — *Researcher*Zachary Zimmerman — *Researcher*Omer Karar — *Meeting Minutes Taker***Summary of Progress this Report**

This week we updated the voltage drop calculations to get the total voltage drop under 5%. With this, two specific cases were considered, one with wire gauge 6 and one with 8 AWG. The voltage drop was just above 3% and 5% for the respective cases. The CAD design was also updated and more specific details were added to account for the special case array. We went on a field trip to the Ames Solar Field, met as a group for work time, and also had our weekly meeting with Black & Veatch.

Pending Issues

We are still working on finalizing the voltage drop calculations to make sure that they are under 5% and continued efforts to finish the CAD drawings.

Plans for Upcoming Reporting Period

We are going to continue to work on the CAD drawings specifically looking at where the cables would run. In addition, adding a drawing that would establish the ground grid to show how the ground cables could be connected to the racks, combiner box, and other equipment on the solar panel farm. We also are going to continue finalizing our voltage drop calculations on the spreadsheet provided to us from the Black & Veatch and perform hand calculations to verify the values. Finally, we are going to look into fencing and protection that will go along with our solar array and substation.

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Madison Lakomek	I led the presentation for Black & Veatch and added the safety moment and new technology. I attend a CAD meeting on Monday, Solar Farm field trip on Tuesday, and our Wednesday Black & Veatch meeting. I worked on replicating the CAD drawing that had already been created as well. I also worked on the weekly report status and the	6	0

	design documentation.		
Brooke Nelson	I researched fencing, gravel, and other requirements for the substation. I attended a CAD meeting on Monday, Solar Farm field trip on Tuesday, and our weekly meeting with Black and Veatch on Wednesday. I worked on trying to replicate the CAD drawing.	6	0
Ashton Randolph	I attended a CAD meeting on Monday, Solar Farm field trip on Tuesday, and our weekly meeting with Black and Veatch on Wednesday. I worked on this week's design document for design contextualization. I worked on trying to replicate the CAD drawings as well as began looking into fencing that could be used.	6	0
Jacob Miller	I researched fencing, gravel, and other requirements for the solar farm. I attended a CAD meeting on Monday, Solar Farm field trip on Tuesday, and our weekly meeting with Black and Veatch on Wednesday.	6	
Jenna Runge	I attended a CAD meeting / demo on Monday, Solar Farm field trip on Tuesday, and our weekly meeting with Black and Veatch on Wednesday. I also worked to update the Voltage Drop calculations and coordinated with those working on layout / CAD to move the combiner boxes to a position which would limit the voltage drop to under our threshold of 5%.	6	0
Madissen Lawrence	I attended a CAD meeting / demo on Monday, Solar Farm field trip on Tuesday, and our weekly meeting with Black and Veatch on Wednesday. I also worked to update the Voltage Drop calculations and coordinated with those working on layout / CAD to move the combiner boxes to a position which would limit the voltage drop to under our threshold of 5%.	6	0
Zachary Zimmerman	I ran a CAD meeting/demo for team members, went to visit a 2 MW solar field in Ames, Iowa. I also attended all team meetings. Worked on voltage drop calculations with Jenna and Madissen to ensure the voltage drop stayed below 5% and designed the small array needed to meet 80	16	

	<p>MW DC. I also worked on the CAD drawings, implementing the changes to the CB locations due to voltage drop issues, and added details for the small <1MW array (array details, component layout, electrical layout), and trenching details. I began researching different ground mounted (fixed-tilt) racking systems. I also conducted research to ensure our solar plant satisfies code requirements.</p>		
Omer Karar	<p>I attended the CAD meeting and demo on Monday, the Solar Farm field trip on Tuesday, and our regular meeting with Black and Veatch on Wednesday. I did a presentation about our team visits to Solar Fields in Ames, and I'm a meeting minutes taker for this week. Besides, I'm working on replicating the CAD drawing.</p>	6	0

Gitlab Activity Summary

Nothing to report.
