

## BI-WEEKLY REPORT 5

MARCH 16, 2021 – MARCH 29, 2021

SDMAY21-37

115/34.5KV SOLAR POWER PLANT & SUBSTATION DESIGN

CLIENT: BLACK & VEATCH

FACULTY ADVISOR: DR. VENAKATARAMANA AJJARAPU

GROUP MEMBERS:

**CHRISTOF BARRIER**

**LOGAN HINKLE**

**KEVE HUGHES**

**BRIAN LEMKE**

**CORTLAND POLFLIET**

**NOLAN ROGERS**

**ERIC SCHULTZ**

### SUMMARY

Over the last two weeks our team met with our mentors to report progress in our grounding design and calculations. We started work on bus calculations for rigid and flexible bus connections. We also received cable sizing information in order to finish out our trench fill tool. Our initial bus calculation looks good so far, and we were correct in omitting calculations concerning the force of ice, given our location of New Mexico. Grounding calculations are a little rough, need clarification regarding a certain value " $n_d$ " and  $D_m$ . We still need to experiment with different grounding configurations as well as write reports for both calculations. Introduced DC battery calculation and mentioned AC system analysis which will be our final two calculations. Lots of material to look over and review. We resumed progress on the cable trench fill tool.

### ACCOMPLISHMENTS

- Trench Fill Tool – Nolan, Brian, Logan, Keve, Christof, and Cortland
  - Received cable sizing information and added that too considerations with Trench Fill Tool
- Substation Bus Calculations Rigid and Flexible Buss – Eric, Christof, Nolan, Brian, Logan
  - Find Ampacity for Rigid and Flexible Buses
  - Force Calculations for bus design
- Grounding diagram – Eric, Christof
  - Made updates regarding grid and grounding rods

Group Member	Bi-Weekly Hours	Cumulative Hours
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Christof	16	59
Logan	6	41
Keve	10	46
Brian	10	50
Cortland	6	40
Nolan	10	51
Eric	16	66

### PENDING ISSUES

- Bus Calculations -
  - Need clarification on final values
- Trench Fill Tool –
  - Just needs updating with new wire sizing.
- Grounding Calculations –
  - Number and size of rods seems off, need clarification of value “nd”

### PLANS FOR UPCOMING WEEKS

- Trench Fill Tool –
  - Finish up this tool
- DC system and battery calculations –
  - Take a first look at DC battery sizing for internal substation use
- AC System Calculations
  - Start calculations for AC load of substation components

### SUMMARY OF MEETINGS

The last two meetings with our mentors we have discussed and were given information to begin our bus calculations and finish up our trench fill tool.