

EE 492 Status Report 5

03/13/2025 to 04/03/2025

Team 41

115/34.5kV Solar Plant & Substation

Client: Black & Veatch

Faculty Advisor: Ajjarapu Venkataramana

Team Members:

Andrew Chizek -- Team Leader

David Ntako -- Lead/Start BV Meeting

Ben Palkovic -- - Meeting Recorder

Mohamed Sam -- Submissions

Sergio Sanchez Gomez -- Communications

Dallas Wittenburg -- Communications

Weekly Summary:

Over the past two weeks, our team has made solid progress on several key parts of the project. For the first weekly meeting with our client, Black & Veatch, we had a great discussion about relaying, our three-line diagram, and grounding. We received helpful feedback from Black & Veatch and continued to develop our drawings and calculations. For the next weekly meeting, we had a discussion about our AC calculations, DC calculations, and the physical layout of the substation we are designing. We have also had great advice and helpful input from our faculty advisor, Dr. Venkataramana Ajjarapu, about the substation and our work continuing with the project. Overall, our team is progressing well with the project.

Past Week Accomplishments

Grounding:

- Making good progress with analysis
- Did research online about soil types in NM
- Created a spreadsheet for calculations

Added SEL relaying to our AutoCAD Drawings

Performed AC calculations

Performed DC calculations

Created Drawings for the physical layout of our substation design

Pending Issues

IEEE 485 website tool (Energysys) is not working, so we need an alternative way for DC analysis

Individual Contributions

Name	Contribution	Hours this Week	Total Hours

Andrew	Worked on finishing AutoCAD comments on our physical layout. Looked into starting our control house design.	9	30
David	Worked on the DC calculations spreadsheet with Sergio. Completed the Excel-based battery sizing tool and refined it based on initial feedback from Black & Veatch, serving as a reliable alternative to the IEEE 485 Enersys website tool. Started working on the BOM.	8	30
Ben	Added SSVTs, PTs, and all connections to the relaying plan and finished revision from BV comments. Research on connections needed for each relay for proper monitoring.	10	35
Mohamed	Created the three-line diagram using AutoCAD and started working on load flow analysis and IEEE 3002.2	8	31
Sergio	Worked on the DC calculations spreadsheet. Completed the Excel-based battery sizing tool and refined it based on initial feedback from Black & Veatch, serving as a reliable alternative to the IEEE 485 Enersys website tool. Started working on the BOM.	8	30
Dallas	Researched IEEE80 for proper grounding of substation, created a spreadsheet for grounding analysis, worked on AC calculation spreadsheet, researched section views for ring bus configuration	8	32

Plans for Coming Week

- Finalize and refine our task for the upcoming presentation.
- Review our progress and ensure all documentation is complete.
- Meet with our advisor once he is available to receive feedback.
- Attend our scheduled client meeting to discuss any updates or new tasks.
- Collaborate as a team to stay on track with project goals and deadlines.
- Address any missing details or improvements needed before the presentation.
- Prepare for next package to send to our client
- Make an excel sheet for IEEE 485 if the online source doesn't work

Action Items for Client

- Begin Layout of Grounding Grid
- Perform Grounding Calculations
- Look into Conduit Plan
- Finalize Control House Location
- Section Views
- IEEE 485 Calculations
- Update DC Analysis