

EE 492 Status Report 3

02/13/2025 to 02/27/2025

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:

During the fifth week, we met with our client, Black & Veatch. We discussed our group's Gantt Chart that was created for this semester for our substation design. We also discussed our team's one-line diagram, our initial ETAP simulations, battery sizing using IEEE resources for our control house batteries, and Schweitzer Engineering Laboratories (SEL) relaying options for protection in our substation. During the meeting, we discussed benefits of different relays including the SEL 451, 751, 487E, 487B, and 311L. We also discussed with our client some research on aluminum bus material and gathered feedback about what our best options are. During the sixth week, we added relaying to our one-line diagram and discussed our AutoCAD drawings with our client. We also sent them a 10% package as requested by our client including all documents, drawings, and work that our team has been working so far. Our client will review our work and provide comments and feedback so our project can continue moving forward.

Past Week Accomplishments

- Discussed One-Line Diagram
 - Added relaying
 - Confirmed # of circuit breakers that we will need
 - Moved relays to connect to CTs in correct spot
- ETAP Simulations
 - Gained progress in laying out our one-line schematics
 - Added relaying into diagram
- Discussed Bus Material
 - Aluminum is best option – weighs much less than copper
 - Highly corrosion resistant
 - Dissipates heat rapidly and evenly

Pending Issues

No issues

Individual Contributions

Name	Contribution	Hours this Week	Total Hours
Andrew	Worked on substation layout research and planning, looked in IEEE485 and battery sizing.	7	14

David	Worked on DC calculation with Sergio, reviewed IEEE 485 for battery sizing, and did some research on relays and SSVT.	8	15
Ben	Created and updated one-line drawing, research on relays, complied 10% package for BV, working on physical layout of substation, reviewed IEEE 485	8	15
Mohamed	Working on ETAP simulation and helping on AC calculations	8	15
Sergio	I reviewed IEEE 485 for battery sizing and collaborated with David on DC calculations. Additionally, I worked on AC calculations and setting up an account for the Enersys Battery Sizing Program to support the analysis.	8	15
Dallas	Made changes to Gantt Chart based on feedback from our client. Reviewed IEEE485 for lead acid battery sizing and helped Mohamed with AC calculations	8	16

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.
- Discuss our substation physical layout on parcel of land in New Mexico
- Create AutoCAD drawing for physical layout

Action Items for Client

- Continue updating One-Line diagram and implement feedback
- Further discuss SEL protection relays
- Continue working on ETAP simulations
- Look into SSVTs
 - Used to power the control house
 - Connect AC to DC panels
 - Might want several

- Look into IEEE485 for Lead Acid Battery Sizing