

EE/CprE/SE 491 WEEKLY REPORT 2

Start Date - September 12, 2024

End Date - September 19, 2024

Group Number: 02

Project Title: Ames Substation

Client &/Advisor: Burns & McDonnell / Hugo Villegas

Team Members/Role:

Derek Elkins - Project Lead

Patrick Musoy - Pilot Scheme Researcher

Mackenzie Ray - Meeting Manager

Nathan Tegeler - Pilot Scheme Researcher

Matthew Wells - Pilot Scheme Researcher

Weekly Summary:

Made the decision without the client to increase the size of the solar farm from 2 to 10 MVA, more accurately reflecting utility scale power generation. Completed I/O list revisions based on feedback from the client. This included reorganizing the document to improve readability. Then we corrected several incorrect details, including the CT and CVT sizes and quantities. The I/O assignments also needed to be restructured to implement the communication with the PLC equipment and the breaker failure relays correctly. The client requested that only one breaker reclose during a fault the other will be operated using SCADA. The transformer protection was also updated and an additional relay was selected to ensure that each part of the substation had a backup relay protecting it.

Past Week Accomplishments:

Mackenzie Ray: Worked on the one-line. Incorporated our relay selection into our previous design. Also modified our previous document to show our design changes since deciding to have a potential breaker and a half expansion.

Patrick Musoy: Revising the I/O assignment and relaying documents to meet the client's need/requirement.

Derek Elkins: This week I helped with revising the one-line and incorporating our design changes to the bus layout.

Nathan Tegeler: Revisions for the I/O assignments. This included restructuring the communications between breaker failure relays and line relays. Additionally, I restructured the transformer protection schemes to only use the current differential with the SEL-387E relay and use the 487e for monitoring internal faults and zero sequence currents measured at the tertiary winding of the transformer.

Matthew Wells: Addition of the PLC equipment selection to the relay documentation.

<u>Name</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>Cumulative Hours</u>
Derek Elkins	Revised One Line	2	38.5
Patrick Musoy	Revising the I/O assignment and relaying documents	1	16
Mackenzie Ray	One Line	4	31.5
Nathan Tegeler	I/O list and relay selection report	9	42.5
Matthew Wells	Added the PLC equipment selection to the relay document. Met with faculty about our project.	3	27.5

Action Item Table

Status	Action Item	Assigned to	Due Date	Priority	Notes
Overdue	I/O list	Nathan	9/20	High	
In-progress	PSCAD model	Nathan Patrick	11/28	High	This will be broken into subtasks once more information is provided on this deliverable.

In-progress	One Line	Kenzie	9/23	Medium	

Plans for Upcoming Week

Mackenzie Ray: Continue refining one-line diagram. Help out where needed.

Patrick Musoy: Start working on PSCAD for project simulation and finish the I/O assignment.

Derek Elkins: Will start working on Elevation Plans.

Nathan Tegeler: Finish the I/O list and meet with Christopher to learn more about how to model relays in PSCAD so that we can complete a simple model to provide the client in our meeting next week.

Matthew Wells: Start the event analysis report deliverable. Identify and outline the criteria of this document, review the formatting with Joseph.

Summary of Weekly Advisor Meeting

N/A