

## **EE/CprE/SE 491 WEEKLY REPORT 6**

Start Date - March 11, 2024

End Date - March 18, 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

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### **Weekly Summary:**

This week, we worked on starting the AutoCAD one-line drawings. We began researching and developed questions for how to complete the I/O report. This included reviewing the documentation for the relays. I/O research also included looking into the specific equipment to use, including breakers, current transformers, and voltage transformers. This will provide the basis for the connections we must make for the I/O on each relay.

### **Past Week Accomplishments:**

Mackenzie Ray: I began working in AutoCAD and becoming familiar with the software. Started the one line diagram and implemented the chosen relays onto the diagram for the lines coming into the station.

Patrick Musoy: I researched transformer protections to finalize with our client's requirements and looked at the I/O assignments requirement.

Derek Elkins:

Nathan Tegeler: Finished the research for transformer protection and began researching how to complete the I/O assignments. This included looking through the relay datasheets to try to identify the available I/O. Began researching what other devices are needed to implement the preconditioned piloting and protection schemes. This includes the breakers, current transformers, and voltage transformers.

Matthew Wells: Inspected datasheets for the relevant relays to understand their I/O system. Looked at example documents equipment needed including breakers, CTs, VTs, electro switches, transmitter-receiver, and line tuner.

<u>Name</u>	<u>Individual Contributions</u>	<u>Hours this week</u>	<u>Cumulative Hours</u>
Derek Elkins	I worked on CAD for the one-line	3	13
Patrick Musoy	I researched transformer protections to finalize with our client's requirements and looked at the I/O assignments requirement.	4	11
Mackenzie Ray	Began CAD work for a one-line diagram	4.5	13
Nathan Tegeler	Finished research for protection devices for the autotransformer. Looked at relay I/O requirements. Began developing a list of required devices needed for the I/O.	6	22
Matthew Wells	Researched the relay I/O assignments and other equipment needed.	3	13

#### Action Item Table

Status	Action Item	Assigned to	Due Date	Priority	Notes
In-progress	One-Line	Kenzie/Derek		Low	
Not Started	General Overview	Derek	4/8	Medium	
Overdue	Transformer protection	Patrick Nathan Matt	3/4	High	We have more questions for our client on the requirements for this.
In-progress	I/O assignments	Patrick Nathan Matt	4/23	Medium	

### **Plans for Upcoming Week**

Mackenzie Ray: Continue working on the one-line diagram as well as begin the site plan. I will start looking for a specific transformer to use to know the phase of our one-line.

Patrick Musoy: I will research the I/O assignments to determine their connection with other devices and how to complete the I/O report.

Derek Elkins: I will start working on the CAD for the general overview of the substation and the elevation design. I will also work with Mackenzie on researching specific transformers.

Nathan Tegeler: Continue working on identifying the I/O connections and devices. Ask our client Joseph about identifying the breakers and how to get information that will be needed to complete the I/O assignments. There is some confusion about what this deliverable should include, such as CAD drawings or just a report.

Matthew Wells: My plans for the following week will be to research the relevant I/O data necessary to complete the report. This will include the I/O connections between the breakers and relays, as well as other expectations from Joseph that we will discuss in this week's meeting.

### **Summary of Weekly Advisor Meeting**

- Questions for Joseph
  - Should we show the Huxley transformer on one line?
  - As of now, what should we show on the one line?
  - Do you want us to design the panel boards and AC calculations for I/O assignments?
  - What are you looking for in a general arrangement?
    - The drawings you gave us to “modify” what are the specific uses for those files.
  - Do we need to find specific equipment, such as a transformer?
  - What should the design report look like -bus configuration?
  - Does getting all deliverables done by April 23rd seem reasonable?