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## EE/CprE/Se 491 WEEKLY REPORT 03

September 9, 2018- September 24, 2018

Group Number : sdmay19-17

Project Title: Substation Design

Client: Burns & McDonnell

Advisor: Craig Rupp

### Team Members:

Jacob Heiller- Controls Engineer

Rebecca Franzen- Studies Engineer

Connor Mislivec- Quality Control Specialist

Riley O'Donnell- Administrator

Tom Kelly- Project Manager

Wilson Pietruszewski- AutoCAD Engineer

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### Weekly Summary:

During this reporting period, we met with Burns & McDonnell via conference call to finalize the project timeline and deliverables due dates. We were able to determine four different deliverables due dates: Grounding and lightning studies- November 2, Physical Design- November 30, AC/DC Studies- March 1, and Controls & NIA- April 12. With the grounding and lightning studies being the first deliverable due, we decided to make the grounding study the main focus for the week.

The grounding study used software that only two of the six of us had ever used before, but we believed it would be helpful in future jobs to all learn how to use it. Since Riley and Rebecca were the only two group members that had used CDEGS before and last week they had run the trial run study, they prepared a CDEGS training session for the rest of the group. After this training session, we then all worked on the grounding study together. This took a large portion of time because we first had to layout the substation in order to design the ground grid.

### Past Week Accomplishments:

- CDEGS Training Session Preparation- Rebecca and Riley
  - Prepared trial run study in CDEGS without following the CDEGS 101 training

- guide
  - o Discussed important topics to cover in training session
- CDEGS Training Session- Everyone
  - o Listened and learned how to use various CDEGS programs such as RESAP, MALT, AND MALZ.
  - o Analyzed results when CDEGS study is completed and run
- Cyclone Substation Grounding Study- Everyone
  - o Researched and visited 161kV-69kV substation to get a better visual of substation with ring bus with a future breaker and a half scheme
  - o Obtained drawings of layout to use to base our layout on to run the grounding study
  - o Created RESAP model using soil resistivity test given to us by Burns & McDonnell
  - o Used conductor specifications and burial depths given to us in the grounding reference document.
  - o Used CDEGS to design and analyze grounding system according to IEEE 80
- Cyclone Substation Grounding Study QC Check - Tom and Connor
  - o Ensured grounding design is consistent with IEEE 80
  - o Checked that grounding design followed client standards
  - o Checked data entered into CDEGS against the grounding reference documents given to us by Burns & McDonnell
  - o Reviewed the information needed for grounding report template given to us by Burns & McDonnell and collected the necessary information from CDEGS.

**Pending Issues:**

- Create meeting agenda for bi-weekly meeting with Burns and McDonnell.
- Work through provided CDEGS Grounding Study Template provided by Burns & McDonnell to ensure all values are accounted for and have been tested in CDEGS.
- Complete grounding report template for Burns & McDonnell
- Markup grounding drawings for future use.

**Individual Contributions:**

Name / Role	Individual Contribution	Hours this week	Cumulative Hours
Rebecca Franzen	CDEGS Training Session & Cyclone Substation Grounding Study	15	26
Jacob Heiller	Cyclone Substation Grounding Study	11	21

Tom Kelly	Cyclone Substation Grounding Study & Grounding Study QC Check	12	21.5
Connor Mislivec	Cyclone Substation Grounding Study & Grounding study QC Check	13	22.5
Riley O'Donnell	CDEGS Training Session & Cyclone Substation Grounding Study	11.5	22.5
Wilson Pietruszewski	Cyclone Substation Grounding Study	12.5	21

Comments and extended discussion:

Plan for coming week:

- Complete grounding study report- Rebecca & Riley
  - Fill in template given to us by Burns & McDonnell
  - Obtain the necessary information from CDEGS for the report
  - Send the report to the client, Burns & McDonnell
- Begin research on lightning protection- Everyone
  - Look at IEEE standard on lightning protection
  - Read through lightning protection study guide given to us by Burns & McDonnell
- Complete practice lightning protection study- Tom and Connor
  - Perform necessary calculations for a lightning study
  - Determine data needed for report
  - Write down any questions that come about for group or for the client
- Get familiar with lightning protection report given to us by Burns & McDonnell-Wilson and Jake
  - Determine the necessary information for the report
  - Analyze past Burns & McDonnell reports for lightning protection

Weekly Advisor Meeting Summary:

- Discussed why our group was interested in power systems
- Discussed weekly reports and project plan for the senior design class
- Finalized project timeline and deliverables due dates