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## EE/CprE/Se 491 WEEKLY REPORT 01

August 26, 2018- September 1, 2018

Group Number : sdmay19-17

Project Title: Substation Design

Client: Burns & McDonnell

Advisor: Craig Rupp

Team Members: Jacob Heiller, Rebecca Franzen, Connor Mislivec, Riley O'Donnell, Tom Kelly, Wilson Pietruszewski

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### **Weekly Summary:**

After being assigned to this project, our group met to meet our advisor, Craig Rupp, and discuss with him our ideas on planning the project. We decided to schedule weekly team meetings, taking place at 7PM on Wednesday evenings in the library. During these meetings, we will discuss ideas, answer questions, make technical progress, and distribute tasks for each role. We also had a conference call with the advisors/clients from Burns and McDonnell. During this call, they briefly described the items they sent to us and shared for us to use throughout the duration of the year. A few of us met with Grant from Burns and McDonnell on Labor Day to go over some sample drawings and discuss what deliverables are expected. We will have bi-weekly conference calls with Burns and McDonnell to update them on the process, taking place on Tuesday evenings at 4:30 PM. These will become less frequent as we become more comfortable with the project.

### **Past Week Accomplishments:**

- Schematic Review - Connor
  - Due to the fact that not every team member has experience in reading electrical schematics, Connor spent time reviewing and explaining general layouts of Substation schematics with the team.
  - Researched substation and common electrical schematic symbols.
  - Compared 138kV & 69kV circuit schematics.
- Grounding study software - Rebecca
  - Familiarize self with CDEGS 101 training course primer workbook given to us by Burns and McDonnell
  - Researched different techniques for measuring soil resistivities.
  - Watched tutorial on various aspects on CDEGS such as RESAP and MALZ.
    - Discussed with Riley previous background knowledge of MALZ as

compared to MALT

- IEEE Standards Review - Tom
  - Reviewed IEEE STD 998-2012 (Guide for Direct Lightning Stroke Shielding of Substations) to prepare for lightning study
    - Reviewed empirical method because we will be performing studies by hand and confirming with software
  - Reviewed IEEE STD 80-2013 (Guide for Safety in AC Substation Grounding) to prepare for grounding study.
- Layout Research - Wilson
  - Researched substation schemes and plan views for several different types of substations.
  - Considered the initial optimal layout for our substation layout and discussed the layout design parameters with the group.
- Protection and Controls and Communications Research - Jake
  - Reviewed documents regarding the P&C and communications systems with the client and inquired about issues.
  - Reviewed the specifications that will be needed during the design process of the substation.
  - Researched Schweitzer Relay specifications and reviewed the Schweitzer website for the appropriate models needed for design
- Communication Lead with Client and Advisor- Riley
  - Set up and organized Google drive for project deliverables
  - Communicated and organized bi-weekly meeting with client, Burns and McDonnell
  - Created document with contact information of group members and Burns and McDonnell advisors
  - Received and organized project files given to us by the client
  - Communicated with academic advisor to set up weekly meetings.

**Pending Issues:**

- Waiting to receive licensing information for CDEGS grounding study software software
- Need to create task checklist of checkpoints and/or deliverables
- Need to complete team reflection

**Individual Contributions:**

Name / Role	Individual Contribution	Hours this week	Cumulative Hours
Rebecca Franzen	CDEGS grounding	5	5

	study research		
Jacob Heiller	Protection and Controls and Communications Research	6	6
Tom Kelly	Reviewed relevant IEEE standards and lightning study solution method	4	4
Connor Mislivec	Reviewed Schematics, attended both meetings	4	4
Riley O'Donnell	Communication Lead with Client and Academic Advisor	4	4
Wilson Pietruszewski	Layout Research	4.5	4.5

Comments and extended discussion:

Plan for coming week:

- Complete Grounding Study Trial Run
  - This will be done using a "dummy" substation
- Review previous grounding studies performed by Burns & McDonnell
- Fully understand scope of work for protection and controls design

Weekly Advisor Meeting Summary:

- Discussed team members' background in power systems and familiarity with the subject of the project.
- Reviewed previous knowledge on substation design
- Explain plan of action with advisor and received feedback
- Planned future meetings and expectations for advisor and team members