EE/CprE/Se 492 WEEKLY REPORT 2

February 2, 2019- February 10, 2019

Group Number : sdmay19-17

Project Title: Substation Design

Client: Burns & McDonnell

Advisor: Manimaran Govindarasu

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
Nicolaus Cory- AutoCAD Engineer

Weekly Summary:
This week, we finalized our revisions to the first semester submittals, the lightning protection study, grounding study, and physical layout. After ensuring that we had made all of the necessary changes, we began working on the tasks that we had delegated to each group member last week. A big part of this week was researching and reading about the different tasks that were assigned to each group member. For each task, we drafted up an extensive list of questions to ask the client to ensure that we were on the right track with the design. For each drawing, we reviewed the protection requirements that our client provided us and made sure we had all the necessary component CAD drawings for each piece of equipment. After this, we were able to sketch a barebones block diagram to depict the one-line drawing that will serve as a template for all the following schematic drawings.

Past Week Accomplishments:
- Finalize revisions to first semester submittal- Everyone
    - Performed a QC check on the dimensions of plan view and elevation views to ensure they match
    - Performed software check for the height of lightning masts using Excel spreadsheet given to us by Burns and McDonnell
    - Checked to ensure all grounding report comments were picked up and all report snippets are correct
- Began AC/DC studies-Nic & Becca
    - Discussed AC/DC system as a whole to gain understanding

    - Research and read documents to supplement understanding
    - Constructed questions for the client that were answered via email and confirmed during the phone meeting
        - Determined how to power auxiliary transformer/station service transformer (from the bus of 69 kV or off the tertiary of the main transformer)
    - Determined we need both 240V and 120V to power the auxiliary equipment
    - Determined the type of battery that would be used: lead acid
    - Began tabulating AC loads and gathering voltage levels and power consumption to the loads
    - Gathered data on DC loads that will be present in order to size the batteries
    - Sizing to be done using IEEE specs and excel macro program
- Began working on One-Line Relay Schematic and Transformer Schematics- Riley & Wilson
    - Performed preliminary research on one-line relay schematics and transformer schematics
    - Formulated a list of questions to ask to ask the client about the design
    - Analyzed previous one-line relay schematics and transformer schematics completed by the client to have a better understanding of style and scope
- Began working on the Protection and Controls One-line - Jake & Tom
    - Performed preliminary research on one-line for protections and controls
    - Emailed the client regarding design aspects and how to properly display the one-line information blocks and what the blocks mean
    - Reviewed previous one-line schematics to determine the standard way to present the necessary data according to the client standards
    - Made a preliminary block diagram showing major equipment and how we assumed they would be connected
- Research communication layouts and plans- Jake & Connor
    - Researched IEEE standards for communication specifications
    - Reviewed the material provided to us by our client
    - Clarified the full scope of the telecommunications design with the client
    - Researched CISCO Packet Tracer

Pending Issues:

- Must choose between a valve regulated or vented style of lead acid battery
- Choose between bus voltage or tertiary voltage for station service xfmr

Individual Contributions:

Name / Role	Individual Contribution	Hours this week	Cumulative Hours
Rebecca Franzen	Began AC/DC Studies	5	97
Jacob Heiller	Began P&C one-line schematics &	5	91

	communications preliminary research		
Tom Kelly	Began P&C one-line schematics	5	96
Connor Mislivec	Preliminary Communications Research	4	94.5
Riley O'Donnell	Began one-line relay schematics & transformer schematics	5	97
Wilson Pietruszewski	Began one-line relay schematics & transformer schematics	5	98.5
Nicolaus Cory	Began AC/DC Studies	5	10.5

Comments and extended discussion:

Plan for the coming week:

- Continue tabulating AC and DC loads to size batteries and charger- Nic and Becca
- Continue work on one-line relay schematic and transformer schematics- Riley and Wilson
    - Continue research of relays and what is included in each schematic
    - Support Tom and Jake on completion of the protection and controls one-line diagram to gain a better understanding of transformer schematic
    - Begin using AutoCAD to draft drawing for one-line relay schematic
- Continue work on the protection and controls One-Line - Jake Tom and Connor
    - Receive additional supporting documents from the client clarifying the full scope of work for the protection and controls one-line and how to create the one-line to client specifications
    - Begin creating a preliminary one-line showing the wiring connections between the CTs, PTs, CCVTs, Relaying, Breakers, Transformers, and additional equipment in the substation while keeping in mind the zones of protection, IEEE standards, and client standards

Weekly Advisor Meeting Summary:

- Discussed how the tasks for the second semester would be divided up amongst the group members
- Discussed progress with semester 1 deliverables

- Discussed plan for completing second semester deliverables