EE/CprE/SE 491 – sdmay20-15

Substation Design

Week 1-4 Report

September 1st- September 30th
Client: Burns & McDonnell
Faculty Advisor: James McCalley

Team Members:

Kaitlyn Ziska – Professor Client Liaison
Brian Mace – Chief Engineer
Brandon Kaas – Scribe
Salvador Salazar – Meeting Facilitator
Justin Fischbach – Test Engineer
Robert Huschak – Report Manager

Past Month Accomplishments:

ORGANIZATIONAL ACCOMPLISHMENTS:

- Set up weekly meetings with team members – 3pm Fridays
- Set up weekly conference calls with client and advisor – 4pm Fridays
- Created Lightning Talk on design requirements & IEEE standards

TECHNICAL ACCOMPLISHMENTS:

1.) Collected technical drawings and design requirements from Burns & McDonnell
  - Reviewed provided drawings to test understanding of substation schematics
  - Researched substation schematics, figures, required components to be included in drawings
  - Research general substation design & configurations from both outside resources and resources provided by Burns & McDonnell

2.) Established group access to CAD for station design schematics
  - Group members who have prior experience with CAD acted as liason to rest of group in terms of teaching/acclimating inexperienced group members to this software

3.) Begin one-line drawing
  - Created rough draft CAD drawing for one-line drawing
  - One-Line included technical elements:
    - 138 kV three breaker ring bus with a 138/69 kV transformer
      - Standard circuit rating
      - 4 sets of 1200/5 ampere, MR, C800 accuracy class, rf = 2.5 CT's per breaker
    - Single 69 kV line exit with a breaker

        - Standard circuit rating
        - 4 sets of 1200/5 ampere, MR, C800 accuracy class, rf=2.5 CT's per breaker
    - 3 Coupling Capacitor Voltage Transformers (one per phase)
        - CCVT's to be rated 80.5,500V phase-to-neutral on the primary
        - CCVT's to have 2 secondary windings rated at 115/67CCVT's to have 2 secondary windings rated at 115/67V
    - Primary line protection for the 138 kV Des Moines line exit using SEL-321 relay
    - Backup line protection for both the line exists using SEL-311B relay
    - Primary & Backup line projection for 69kV Iowa City line exit using SEL-311L relay
    - SEL-352 relays used for breaker failure protection on the 138kV ring bus breakers as well as the 69kV breaker

Pending Issues:

- Continue working on and perfecting One-Line Drawing to be submitted to Burns and McDonnel this week

Plans for Coming Week:

- Continue working on and perfecting One-Line Drawing to be submitted to Burns and McDonnel this week
- Burns & McDonnell will review this drawing and return it to us with any corrections/developments still necessary to make

Individual Contributions:

TEAM MEMBER:	CONTRIBUTION:	WEEKLY HOURS:	TOTAL:
Kaitlyn Ziska	Worked on CAD drawing of one-line, reviewed substation parameters, created weekly status report	6	24
Brian Mace	Worked on CAD drawing of one-line, reviewed substation parameters	5	25
Brandon Kaas	Worked on CAD drawing of one-line, reviewed substation parameters, organized meetins & conference calls	6	24
Salvador Salazar	Worked on CAD drawing of one-line, reviewed substation parameters	5	24
Justin Fischbach	Worked on CAD drawing of one-line, reviewed substation parameters	5	26
Robert Huschak	Worked on CAD drawing of one-line, reviewed substation parameters, helped group members acclimate to CAD	7	26