

## **EE 491 – sdmay19-26**

# **115kV / 34.5kV SOLAR POWER PLANT/SUBSTATION DESIGN PROJECT**

## **Week 2 Report**

*Monday (9/10/2018) – Sunday (9/16/2018)*

*Client: Black & Veatch*

*Advisor: Venkataramana Ajjarapu*

*Team Email: sdmay19-26@iastate.edu*

### **Team Members:**

Katayi Katanga – Team/Communication Leader

Nur Shuazlan – Meeting Scribe

Yao Cheah – Website Manager #1

Ahmed Sobi – Layout Designer #1

Chufu Zhou – Website Manager #2/Layout Designer #2

Tam Nguyen – Report Manager

### **Weekly Summary:**

This week, we had a meeting with the client and our advisor, Dr. Ajjarapu. Then, we went through the project description together, and we started to research some basic knowledge about design solar power plant and substation.

### **Summary of Client Meeting:**

We went through a brief review of power engineering and some components that we will be seeing and using throughout our project. Cole gave an explanation on solar networks and what we would need to do regarding solar networks for our project. Students will most likely start with the solar network, they will design enough arrays for the amount of power they need, and 3 feeders. Students should check the array parameter tool.

The client want team come up with an optimal location for solar plant. What is meant by a fixed rack system, we will be using this system for our plant. Team must review data sheets and information about the following:

Inverter: Eaton 1666KW

Panel: Hanwha 325W

DC Voltage: 1500V

ILR: 1.30 – why this value?

### **Summary of Advisor Meeting:**

Dr. Ajjarapu gave us his expectations for this semester; he instructed us to swap roles for the project. Also, he gave us a thorough conceptual knowledge base on the workings of a substation with some specific subjects to research before beginning design.

### **Past Week Accomplishments:**

Everyone:

- Read and went through the solar documents Cole sent us and prepared questions
- Did research on solar power plant and substation designs and components

### Pending Issues:

- Need to figure out how the drawings and diagrams interconnect, especially the one-line and key protection diagrams
- Need to figure out how to post documents on the website

### Plans For Next Week:

Everyone:

- Weekly meeting with client and advisor
- Get started on Gantt Chart
- Get started on the project plan V1
- Get started on team website

### Individual Contributions

Team Member	Individual Contributions	Hours	Cumulative Hours
Katayi Katanga	<ul style="list-style-type: none"> <li>- Did research on:-               <ul style="list-style-type: none"> <li>- ILR</li> <li>- Fixed and rotating solar racks</li> <li>- Solar location calculations</li> </ul> </li> <li>- Attended four meetings</li> </ul>	8	9.5
Nur Shuazlan	<ul style="list-style-type: none"> <li>- Did research on:-               <ul style="list-style-type: none"> <li>- Substation equipment</li> <li>- Single Line diagram</li> <li>- Inverter and ILR</li> <li>- Solar panel</li> </ul> </li> <li>- Reserved rooms for client and team meetings</li> <li>- Attended four meetings</li> </ul>	10.5	12.5
Yao Cheah (YJ)	<ul style="list-style-type: none"> <li>- Did research on:-               <ul style="list-style-type: none"> <li>- power plant location</li> <li>- power plant spacing</li> <li>- Inverter load ratio</li> </ul> </li> <li>- Attended four meetings</li> </ul>	6.5	8.5
Ahmed Sobi	<ul style="list-style-type: none"> <li>- Did research on:-               <ul style="list-style-type: none"> <li>- solar power plant location</li> <li>- area calculation</li> <li>- inverter load ratio</li> </ul> </li> </ul>	6.5	9.5

	<ul style="list-style-type: none"> <li>- Eaton 1670kV specification</li> <li>- Attended four meetings</li> </ul>		
Tam Nguyen	<ul style="list-style-type: none"> <li>- Did research on:- <ul style="list-style-type: none"> <li>- Devices in solar power plant</li> <li>- How to set up the panels to get 1500V output.</li> </ul> </li> <li>- Attended three meetings</li> </ul>	6.5	9.5
Chufu Zhou	<ul style="list-style-type: none"> <li>- Did research on:- <ul style="list-style-type: none"> <li>- Hanwha 325W Panel</li> <li>- Inverter Eaton 1666 kW</li> </ul> </li> <li>- Attended four meetings</li> </ul>	7.5	9.5

Team Hours: 45.5

Cumulative Team Hours: 59.0