
Black & Veatch's 138kV/13.8kV Substation Design Project

SDMay18-06

Faculty Advisor: Dr. Ajjarapu

EE 492 Report

Date: 1/27/18 to 2/9/18

Andrew Brown	-AutoCAD Director, Design Engineer
Eric Fritz	-Meeting & Communication Director, Test Engineer, Design Engineer, Quality Assurance
Brent Hines	- Project Lead, Materials, Executive Budget lead, Design Engineer
Gavin Christensen	-Chief Design Engineer
Weng Hoong Loo (Terry)	-Scheduling, Design Engineer

Summary of Progress this Report

In our meetings we emphasize safety through continuing education. We rotate through our team and each week one person presents on an issue they deem important. In this period we covered typing safety, workplace eye safety, and winter vehicle driving safety.

We fixed the issues with our power calculations of mislabeled items and updated for accuracy.

The design document database was updated by changing the type name for the key protection plan to a one line diagram. We changed documents 1806-011, 012 and 013 to be of the panel elevation type. We changed 1806-024 to be a protection and control schematic.

Pending Issues

We will create a document that gives an overview of the project, our accomplishments, and design decisions to assist in describing the project succinctly.

We will complete the feeder diagrams (1806-015, 016,017).

Individual Contributions

Team Member	Contribution	Weekly Hours	Total Hours
Andrew Brown	Worked on drawing for feeder relays, participated in group meetings, discussed revisions with Black & Veatch.	14	101
Gavin Christenson	Worked on the ABS 10 and 13 drawings, assisted with the DC calculations, participated in group meetings, discussed revisions with Black and Veatch.	20	104
Eric Fritz	Reviewed completed documents and corrected minor mistakes in the naming of components on the documents. Corrected an assortment of issues in the document database including who worked on each diagram. I recorded the details of the meeting with Black and Veatch and reported them in the prescribed bulleted format.	17	139
Brent Hines	Continued to work on the DC calculations for the DC components of the substation. Created a document entailing each DC component of the substation, and where the information of the DC component can be found. Updated the DC and AC Aux to correspond with each component,	22	144

	changing fuse sizes to ensure proper levels of current to ensure each component will be safe in the case of a fault.		
Weng Hoong Loo (Terry)	Reviewed and resume cleaning up of all drawings to ensure the title block and revision cloud placements are consistent. Completed the backup relay document to match the project description. Converted all drawings to pdf format.	20	101

Plans for Coming Week

We will begin work on the breaker failure diagram (1806-022).

We will select a transformer based on the power calculations we have completed.

Document Database

DWG NO v0	DWG NO v1	Rev	TITLE v1	TYPE	DATE ISSUED	CONTRIBUTORS	REVIEW ED BY	REVIEWED BY	STATUS
			ONE LINE DIAGRAM						COMPLETE
1806-110	1806-001	2R	KEY PROTECTION PLAN	1 LINE DIAGRAM	1/9/2018	1806/ ISU		CAB/ B&V	COMPLETE
1806-120	1806-002	2R	AC1 138kV	3 LINE DIAGRAM	11/8/2017	TL, ECF/ ISU		CAB/ B&V	COMPLETE
1806-121	1806-003	2R	AC2 13.8kV	3 LINE DIAGRAM	11/8/2018	BDH/ ISU		CAB/ B&V	COMPLETE
1806-123	1806-004	2R	AC AUX	PROTECTION & CONTROL SCHEMATICS	1/9/2018	BDH, TLWH/ ISU			REVIEW
1806-150	1806-005	2R	PRIMARY RELAY	PROTECTION & CONTROL SCHEMATICS	1/8/2017	BDH, TL, GDC/ ISU			IN PROGRESS
	1806-006	2R	BACKUP RELAY	PROTECTION & CONTROL SCHEMATICS	1/8/2017	ABB, GDC, TLWH/ ISU			REVIEW
	1806-007	2R	CB 4 RELAY	PROTECTION & CONTROL SCHEMATICS		ABB/ ISU			IN PROGRESS
1806-130	1806-008	2R	CONTROL HOUSE PANEL LAYOUT	LAYOUT DIAGRAM	11/20/2017	ABB, GDC/ ISU		CAB/ B&V	COMPLETE
1806-131	1806-009	2R	CONTROL HOUSE CABLE TRAY	LAYOUT DIAGRAM	11/20/2017	ABB, GDC/ ISU		CAB/ B&V	COMPLETE
1806-132	1806-010	2R	CONTROL HOUSE LIGHTING LAYOUT	LAYOUT DIAGRAM	11/20/2017	ABB, GDC/ ISU		CAB/ B&V	COMPLETE
1806-133	1806-011	2R	PANEL 1 COMMUNICATION	PANEL ELEVATION	11/3/2017	1806/ ISU		CAB/ B&V	IN PROGRESS
1806-134	1806-012	2R	PANEL 3 BANK 1	PANEL ELEVATION	11/20/2017	1806/ ISU		CAB/ B&V	COMPLETE
1806-135	1806-013	2R	PANEL 4 BUS 1	PANEL ELEVATION	11/3/2017	1806/ ISU		CAB/ B&V	COMPLETE
	1806-014	2R	MAIN AC 138kV/13.8kV	3 LINE DIAGRAM					UNEDITED
	1806-015	2R	FEEDER 1 RELAY	PROTECTION & CONTROL SCHEMATICS	1/8/2017	BDH/ ISU			IN PROGRESS
	1806-016	2R	FEEDER 2 RELAY	PROTECTION & CONTROL SCHEMATICS	1/8/2017				IN PROGRESS
	1806-017	2R	FEEDER 3 RELAY	PROTECTION & CONTROL SCHEMATICS	1/8/2017				IN PROGRESS
	1806-018	2R	ABS SWITCH 10	PROTECTION & CONTROL SCHEMATICS					IN PROGRESS
	1806-019	2R	ABS SWITCH 13	PROTECTION & CONTROL SCHEMATICS					IN PROGRESS
	1806-020	2R	BANK ANNUNCIATOR	PROTECTION & CONTROL SCHEMATICS					UNEDITED
	1806-021	2R	BANK 1 AUXILIARIES	PROTECTION & CONTROL SCHEMATICS					UNEDITED
	1806-022	2R	BREAKER FAILURE	PROTECTION & CONTROL SCHEMATICS					UNEDITED
	1806-023	2R	COMM OUTSIDE STA	PROTECTION & CONTROL SCHEMATICS					UNEDITED
	1806-024	2R	COMM RTU	PROTECTION & CONTROL SCHEMATICS					UNEDITED
	1806-025	2R	DC AUX	PROTECTION & CONTROL SCHEMATICS	1/10/18	BDH/ ISU			REVIEW
	1806-026	2R	IO BOARD	PROTECTION & CONTROL SCHEMATICS					UNEDITED

