Summary of Siemens Crude Oil Pump Station

Overview
This report summary the Siemens Crude Oil Pump Station Capstone Project phase III, sponsored by Siemens, conducted Penn State Learning Factory. The main purpose of this phase is to design and generate bill of materials of Oil Pump Station model. The project is finished by two teams, ME team and EE team, and this summary focus on EE team’s work.

Objectives
The EE team worked with the ME team to design the pump station that consists of 4 pumps, 4 motors and 4 variable speed drives. The pump station also including controllable valves, temperature sensors, pressure sensors, PLC, power supply, control panel, circuit breaker and driver for the pump motor. Sensor connections, valve connections, driver connections and transformer connection is also included in the design.

Approach
- Determined fluid pressure and temperature range.
- Selected appropriate sensors for the application.
- Calculated the total I/O ports needs and the types.
- Selected appropriate PLC and its I/O modules.
- Calculated total power needed for the control system.
- Selected the appropriate power supply unit.
- Defined each sensors, valves, control panel and PLC’s name. Drawn CAD drawing showing the connection of each components. Name each wire in the drawing.
- Selected pump driver with ME team.
- Researched on driver, and establish connection between drivers and PLC, drivers and transformers. Drawn the connection on CAD drawing.
- Generated the finished Bill of material.

Outcomes
With this design, Siemens will be able to review and modify the electrical and control design. The result of the project can serve as a guide for the project’s next phase.