

Ethics and Professional Responsibility

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Team: SDDec-24-02





What is a substation?

A substation acts as a middleman in the electricity supply chain.

It takes voltage from one level to another.

- Step up - low to high
- Step down - high to low

A Bus is system of uninsulated conductors that carry electricity from one point to another



Project Overview-Ames Substation

- Our main goal is to tap in a 69kV, 2 MW solar farm into an existing substation
- This station already has 3 input lines, the solar farm would make four
- Each lines requires a different pilot/relaying (communication of system) scheme based on its specific needs and standards
- Must design a bus configuration system that will implement the new line with a high level of reliability and a relatively low level of complexity to make both designing and maintenance easier
- End goal is to have a dynamic simulation with an event analysis report



Communication Honesty

- Relevance to project
 - Clearly describe our progress and elaborate on any questions we have
 - Documenting IEEE standards we are using
 - Reporting accurately our progress
- Team's approach in this area
 - Check in bi-weekly with the client about progress and ensure the progress reported is accurate
 - Presenting work that is not our own with sources, initially documenting with links to sources
- Why team upholds ethical professional responsibilities
 - Ensure the client is happy with the product
 - Ensure pride in our work
 - Ensure high quality work
 - Ensure project is up to IEEE and NEC standards

Financial Responsibility

- Substations are expensive
 - Requires a lot of different devices each relatively expensive
 - Transformer alone would be roughly million
- We were not given a budget
 - Have not taken cost into consideration when picking equipment
- Look into cheaper options
 - Are the expensive ones worth it?



Sustainability



- We are tapping in a solar farm into an existing substation
 - Renewable power generation is great for sustainability
 - We are not sure if the other power sources are sustainable
- Our approach has been to try and minimize the space we use
 - Limit the impact to the environment
- To better uphold this ethical issues we will ask if our other sources are sustainable or not
 - We could pivot our design to tap in more sustainable sources



Conclusion

Our team has effectively communicated our progress with the tasks we have individually been working on. Our plan is to work towards an environmentally sustainable solution. This might mean trying to ensure we minimize space needed for the substation.

