EENG 581 Course Project
Phase 1: Design Criteria
Company: AC/DC (All Current/Direct Convenience) Consulting
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| ID | Criteria Description | Justification | How will it be modeled? |
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| 1 | Reliability | The purpose of this project is to increase grid reliability in summer months, so reliability is a top priority. | When we perform our power flow simulations, we will consider an outage at times when a transmission line exceeds its power capacity. From this, we will gather various reliability metrics (SAIDI, SAIFI, CAIFI, etc.) and we will have inequality constraints on the levels of these metrics. |
| 2 | Cost | Higher project costs will put financial burden onto the consumers, especially those of lower income, and will not be sustainable in the long run. | Minimization of the cost will be the main objective. This criteria primarily concerns the cost of capital investment and O&M costs of improvement decisions. Other criteria will have an associated cost which will allow for their inclusion in the objective function and comparison with the hard development costs. |
| 3 | Social Justice | In the past, harm has been caused by utilities ignoring vulnerable demographics – it is important to recognize the vulnerabilities of each tract and tailor the solution accordingly. | Establish a vulnerability index for each different tract ID based on census data. Reliability metric constraints will then be tuned based on the vulnerability of a group, with more susceptible groups requiring higher reliability. |
| 4 | Emission | Climate change is one of the most important challenges facing engineers today, and air quality is a primary driver of health issues. The impetus for this project is record high summer temperatures, induced by carbon emissions/climate change, and controlling these is an integral part of the solution. | A price per ton of $CO_2$ equivalent from added generation will be a contributor to the cost minimizing objective function. This effectively increases the cost of high emissions generation. |
| 5 | Land Use | It is important to preserve the wildlife refuge, the state park, and forested area. Development affecting these areas will cause environmental harms and we have other options for locations to generate power. | Certain land classifications will be protected from development. We will exclude these areas from development considerations. |