

4910 Lightning Talk: Ethics

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Project Overview

- Client: Burns and McDonnell
- User: ISU Utilities and customers
- Goals:
 - Model and analyze the ISU Microgrid
 - Increase reliability for end users
 - Design upgrades for both transmission and distribution power systems
 - Create future plans for load growth and increase of renewable energy



Problem Statement

The Iowa State Microgrid has some functional and future planning upgrades that are needed:

- Connect the entire campus to the microgrid
- Plan for future load growth
- Add in protection coordination to stop large power outages
- Replace and upgrade old and not functional equipment
- Include and switch to renewable energy sources

WHAT HAPPENS
WITH NO CHANGES
FOR THE FUTURE?



...more power plant fires
& loss of power ⚡
& loss of MONEY \$

Ideals of Professional Responsibility

- Performing Well

Social Responsibility

- Producing a model to help increase reliability to the customers of the Iowa State Grid
- Add in protection coordination and provide recommended updates
- We uphold this ethical and professional responsibility by always thinking of the end user and client

Ideals of Professional Responsibility - Needs Improvement

Sustainability

- There is a current social and political shift to wanting to use renewable and green energy sources, but these energy sources are normally more expensive to produce energy
- Our team is looking at optimizing the current energy production which includes very little power production from renewable sources
- To better uphold this ethical standard we will explore the ways in which we can incorporate renewable energy sources

Broader Context Area-Four Principles Chart

	Beneficence	Nonmaleficence	Respect for Autonomy	Justice
Public health, safety, and welfare	Design helps provide reliable power to customers.	Design will help improve unsafe practices	Allow users to have a reliable access to power	Promotes access to consistent power
Global, cultural, and social	The upgrades will help meet the needs of the users of the Iowa State Grid	Design will help improve unsafe practices	Affects no cultural practices	Will help provide equal distribution of power
Environmental	The upgrades will help meet the needs of the users of the Iowa State Grid	Work to add renewable energy sources	Provide a design that increases renewable energy without affect reliability	Would not disturb the environment
Economic	The design would help increase income, but would require up front cost	Would not disrupt the economy	Increase renewable energy while not affecting the cost	Would not financially harm any party

Ethical Concerns

Ensuring we are using accurate information

- Only so much information about how the Iowa State Grid functions is available for our team to work with
- Estimations about how much power a building uses and the rating on some equipment need to be made

Ensuring we are using accurate information

- Staying within a reasonable financial budget for upgrades to not cause financial strain

Virtue - Safety First

Burns and McDonnell's core virtue is safety first

- Safety come in many different forms whether it's personal, mental, or on the project
- Looking to ensure the safety of the customers, utility, and the university



Conclusion

Key Takeaways

- Our team is uphold the ethical social responsibility to helping to improve the grid
- We need to take into account more of the sustainability aspect of this project
- Check-in often about information we've collected to make sure that we are working with accurate information
- Keep Safety always the first priority