

# Cooperative Education Report

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**Major:** Electrical Engineering

**Co-op Employer:** GE Energy- Transmission and Distribution Projects Division

**Employer Location:** Oakbrook Terrace, IL

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My co-op assignment in the Transmission and Distribution (T&D) Projects Division of GE has been a useful and challenging experience that has strengthened both my professional and technical skills. In this report, I will outline the projects I was involved in, the training I received, the skills I improved, and conclude with an overall reflection of my time in Chicago.

Over the four month period I was with GE, I was assigned ten different projects, each with its own unique challenges. One of my main assignments was to finalize the development and implementation of our branch's data form and reporting software. This includes creating new data entry forms, developing a report format for information output, and implementing offline data entry for on-site reporting. I headed up a small project team, in which new forms and ten standard reports were refined throughout numerous meetings with engineers and managers. I worked with project engineers to address some concerns with data access and formatting in the system that were originally outside of the project scope, and with the guidance of project managers I created a uniform project description that could be used with GE's other internal databases. I created a form for offline data entry in Excel with VBA macros (something I hadn't been exposed to before), which interfaced with the proprietary GE system to automatically upload offline entries, and I documented the useful features of the system before passing the project on to upper management. My primary technical difficulty was to learn and effectively utilize the proprietary software interface, but that was not nearly as challenging as managing the six or seven parallel tasks this project required. Leading meetings, organizing tasks, and interfacing with so many busy engineers and managers was a great way for me to learn and develop my skills for project management.

While at GE, I also had the chance to work on a design process automation project for generating power substation schematics and wiring diagrams. I was very glad to have this opportunity, because it has exposed me to one and three line drawings, as well as termination cabinet and panel layouts. I helped to create a substation template by tracing connections across several drawings and inputting their termination points in a wiring table, and through this process I was able to pick up a lot of useful information about the structure and design of a typical substation. Each day I spent on this project I learned more, from standard component nomenclature to the intricacies of designing panel layouts. I implemented a feature in this tool which allowed automatic updates of wire and cable names throughout the wiring charts, and the software is now in use for project design.

Another of my main assignments was a marketing assessment and recommendation project. I headed a team to investigate the status of GE's T&D marketing material, as well as to

review T&D's website as compared with competitors' sites. My work on this project led to several presentations to our branch manager, as well as to the communications/marketing department for the overall T&D branch of GE Energy. My suggestions included a website I designed and created based on the best marketing material taken from several T&D companies. This website design was passed to the communications branch, and GE's T&D website is in the process of being completely overhauled. This assignment allowed me to refine my presentation skills, and taught me a lot about good marketing practices. I also enjoyed learning to design and create a website using Microsoft Expression Web software.

Three other projects I worked on were related to investigating new technologies that could improve GE's current substation design standard. These projects required me to interact with vendors for price quotes, to learn about associated costs when installing substation hardware, and to understand specific aspects of the substation engineering process. As a result of these projects, I was able to talk with structural engineers and sit through meetings to decide project specifics. I gained a lot of insight into the team-based design approach used when building a substation.

The final four projects I worked on involved legal compliance issues. I researched government permitting requirements, cyber security requirements, state business practice requirements, and design criteria requirements for specific on-going projects in the T&D Projects branch. In each case, I contacted officials and experts outside of our division to discuss issues that I'd only recently begun learning about. These communications, while personally challenging, have been a rewarding and necessary step in my growth as a professional. Besides the legal knowledge and communications skills I gained while completing these assignments, I also improved my data management and presentation skills, because these legal reports required a lot of information to be condensed into a user-friendly, cohesive reference material.

Besides the knowledge and skills that I gained from working on specific assignments, I also received valuable experience in other ways. Early in the co-op, I was able to sit down for training meetings with several engineers of various disciplines, to learn about what they do and how they do it. Throughout the internship, I regularly met with the branch manager to discuss corporate news and to learn about the business side of our branch. There were also frequent, educational meetings with new vendors who were pitching their technologies to the company. Toward the end of the co-op, my managers took me on a very informative site visit to an active substation. Most notably, I was provided with feedback and constructive criticism on my work and my professional skills twice during the internship as part of the standard GE review process. Each of these activities had a strong positive impact on my technical and professional development as a co-op student.

Working at GE was an educational and rewarding experience. I really enjoyed interacting with and learning from the GE engineers, and I've gained a new understanding of corporate culture and business function. I was challenged to lead project teams and to meaningfully contribute to several assignments in parallel at GE, and I learned and grew a lot as a result. I was given a great opportunity to develop my technical and professional skills with this co-op, and over the past four months I've worked hard and improved tremendously as an engineering professional.