Getting Involved with Safety

The IEEE Industry Applications Society (IAS) Electrical Safety Workshop (ESW) is popular with anyone who wants to help improve the safety culture of the electrical work community. Young professionals are more frequently getting involved. During the 2018 ESW in Fort Worth, Texas, I met Christa Swafford, who has been out of college for three years but already has been a contributor at the workshops. I asked Swafford about her schooling, her present work, and how she became involved in the ESW.

Formal Education

Swafford explained, “I was homeschooled from kindergarten up through 12th grade.” Through that experience, she learned a lot about self-study and teaching herself. “I am the firstborn of four children to parents who were both college educated as electrical engineers. In fact, both my grandfathers were also engineers (one electrical and one chemical). So that means I am a third-generation electrical engineer,” she said.

Swafford attended Louisiana Tech University, the alma mater of both her parents and one of her grandfathers. She majored in electrical engineering, with an emphasis on control systems. She minored in technical writing, which has been a passion of hers since high school. One university class she took covered the art of technical presentation and gave her some great ideas. She learned how to create presentations that communicate technical and possibly dry information in ways that will keep her listeners interested and prevent them from yawning during the presentation or hoping for it to be over soon. It’s an important skill that impacts her work today.

Her college days also included summer internships that gave her some practical work experience. In one internship, she worked at a DuPont plant, and in her final summer internship, she worked at the corporate offices of DuPont in Wilmington, Delaware. There, Swafford gained experience on the corporate side as a consultant for several business lines. From that vantage point, she saw a variety of things at different plants, and she was able to work on some instrumentation projects that were more along the lines of her control systems training. From her internship work, Swafford said, “I learned a lot, and I also made a lot of good connections with people, especially from being in the head corporate office.”

Transition from College to the Working World

At the end of Swafford’s last internship, she received a job opportunity. DuPont approached interns who were about to graduate and explained the details of its engineering field program, which takes recent engineering school graduates and places them through a series of two-year rotational work assignments. This way, new engineers get to try out a variety of roles within different parts of the company and with various business lines. They can do from two up to five rotations, with each lasting roughly two years. Swafford explained, “At the end of four or ten years, DuPont will have a well-rounded engineer, and you will have a lot of experience and a good idea
what direction you want to pursue for the next step of your career.”

She was very interested in this format because she enjoyed working for DuPont and her manufacturing experience with them. “I saw the DuPont field program as a good way to have a variety of different experiences within the manufacturing space that would help me decide what direction I ultimately want to take for my career. I interviewed and was accepted for their program,” Swafford said. Swafford knew she had a job by October of her senior year and found out where the job was in April. She started her first full-time job with DuPont in July 2015 at its plant in Cedar Rapids, Iowa.

Swafford said, “One of the things that impressed me about this particular rotational program is that, compared to several others I might have considered, you aren’t just spending a short period of time at each training location like in the internship or co-op jobs.” She explained, “By having longer rotation intervals, it gives you time to come up to speed in the real world. In fact, your first assignment may last longer than two years, just to make sure you can come up to speed fully and can contribute in your work role before you proceed to the next rotation.”

**Typical Workday**

Swafford has chosen to work in the chemical manufacturing industry. She works at DuPont’s Industrial Biosciences plant in Cedar Rapids, which manufactures enzymes for laundry and dishwasher detergents produced by other manufacturers. The enzymes replace harsher cleaning agents in detergents, providing improved cleaning performance at lower washing temperatures. That translates into lower energy consumption and improved sustainability for our environment with a product that is safer, cleaner, and more efficient for everyone. “I am a few steps back in the process chain, because my work is on the electrical distribution system that supports the manufacturing process; but, nevertheless, I like the fact that the product we make is providing an overall benefit to society,” Swafford said. “Also, I like working as an electrical engineer in this manufacturing industry because there is a new challenge for me every day.”

When asked about her typical workday, Swafford explained this is the first time that her job site has had an electrical engineer working for them. “I have been allowed to essentially tailor-make the job around my strengths.” Every day, she attends a 6:45 a.m. meeting for a crossover with the night shift, and the employees discuss what they’re going to do that day. The meeting includes Swafford as the electrical engineer along with the mechanical engineer and maintenance technicians.

“If I find out what has gone wrong during the previous night and if any of the workers need my help,” said Swafford. “Typically, I will follow up on the electrical matters that need my attention. Depending on the day, I may have some standing meetings, but usually not a whole lot. I work a lot with our maintenance folks. I also coordinate the electrical contractors’ work, making sure they have the directions, supervision, and permits that they need.” Some of her time may be spent writing scopes of work for contractors or for bidding out purposes if it’s a large maintenance job. She may follow up on any troubleshooting that needs to be done to see what went wrong and what needs to be done to keep the problem from recurring. Swafford may work on electrical maintenance plans, deciding what frequency of maintenance is needed.

“I also work on new projects, such as our latest requirement to add more lighting in a particular area of our plant,” Swafford explained. “Sometimes I work with the process engineers, giving them information on the electrical energy usage of different parts of the process throughout the plant,” Swafford continued. “It is my responsibility to maintain the electrical drawings, schematics, and data about how much electric energy is consumed and where within our plant.” Some of her longer-term projects include the electrical coordination and arc-flash studies for the plant.

She also works on improving the electrical safety program for the plant site. Swafford said, “We had a lot of good electrical safety practices in place, but they weren’t necessarily being administered consistently. So I am working to clarify the electrical safety procedures and turning this into a formal training program for our staff. I train our operations, engineering, and maintenance departments on our electrical safety program.” She also helps out in upgrading the electrical personal protective equipment and conducting the plant emergency practice drills in conjunction with the local emergency response team.

**Discovering the IEEE IAS and Its Benefits**

Swafford became involved in the IEEE during her senior year in college, when she served as secretary of her university’s IEEE Student Chapter. At DuPont, one of Swafford’s mentors, Dan Doan, with whom she worked during her internship and, again later, when she became a full-time employee, encouraged her to attend the ESW. He believed it would offer beneficial connections and training for her, because one of her job roles was to be leader of the electrical safety program at the DuPont site where she worked. Reflecting back, Swafford commented, “I had an extremely positive experience attending
the ESW in 2016, both in terms of learning and the actual content of the presentations. What's more, I was also impressed with the culture of the ESW, because there is a general atmosphere that everyone has come there to work together to improve the electrical safety culture in our industry and in our workplace.” She saw a lack of commercialism and a willingness of attendees to freely share lessons, mistakes, ideas for improvements, and helpful feedback with one another. Swafford found all of this to be very attractive, which encouraged her to take the ideas she had gained from that first ESW conference experience back to DuPont with her, where she and her colleagues were able to incorporate her ideas to make some improvements.

At the conclusion of that conference, Doan approached her about coauthoring a paper for presentation at the next ESW. Her assignment was to come up with proposed topics on electrical safety for this paper so they could produce a suitable abstract to submit to the ESW committee. Swafford ended up working with Doan and two other DuPont colleagues who had been involved in electrical safety response drills at their respective DuPont sites. They cowrote a paper that was presented at the 2017 ESW conference. Said Swafford, “That was a very positive experience for me, because I really enjoyed my work contributions to the writing and presenting of our paper at the ESW.” She also liked establishing industry connections and networking with similar-minded people along with receiving valuable information from the other presentations.

“Later in 2017, I became aware of what the IAS was about, first by being asked to record a webinar of my ESW 2017 paper,” Swafford said. Because the IAS sponsored the ESW, she looked further into the Society and learned that it offered other resources and connections that could help her, such as technologies that could advance projects at her work site and enable her to do her job more efficiently. In 2018, she was able to go to the ESW and bring one of the technicians from her work site who is involved in training for their maintenance group. Swafford said, “It is getting close to the time for my rotation move to another DuPont location, so I was able to get justification to send an additional person who would be at the plant site longer term.”

Leisure Time
Cedar Rapids, where Swafford lives right now, is several hours away from her family. In Cedar Rapids, there are several things she likes to do with her free time. “There is a great community at my local church, where I like to spend time volunteering for nursery and setup duty, singing on the music team that they have, and doing activities with my friends at the church,” Swafford explained. “I also enjoy just going out for a drive. When I don’t have anything to do for a couple of hours, I may just go out for a long drive. In August 2017, I drove from Cedar Rapids to Tennessee to view the rare total solar eclipse.” Swafford’s grandparents live along the path of the total eclipse, so they had a mini family reunion and got to see the solar eclipse together. “I also like to write letters. Yes, I know that handwritten letters are becoming rare today, but who doesn’t like receiving one?” Swafford asked.

Valuable Lesson Learned
Swafford recollected a memorable learning experience she had at work. “In my first summer internship with DuPont,” she said, “I was tasked with gathering information from several different work groups. My mentor had given me the names and locations of the people I needed to talk to. I then asked him for their phone numbers or e-mail addresses because I didn’t know who they were, and I didn’t know my way around the DuPont site yet.” She thought she would send e-mails to the people in the work groups asking them for the information she needed.

“I remember the disappointment in my mentor’s voice when he said he thought that I might go talk to them in person.” Swafford explained that she hadn’t yet felt fully prepared to directly interact with any of the work groups, but since it seemed that her mentor expected her to do more than simply send e-mails, Swafford sought directions and figured out how to find and meet with them. “In the process, I got to learn my way around the plant site better and faster. But I also saw what my mentor was hoping for, that it is almost always more effective to deal with people in person, whenever possible, rather than just sending them an e-mail.”

This is especially true in the manufacturing world, where you are dealing with a variety of different people, from maintenance technicians up through the plant manager. Swafford said, “Having an in-person interaction with them makes them know that you care, and it’s easier for you to adjust the tone of any request for favorable impact with the other person. You may get your information more quickly than waiting around for a reply to your e-mail. This lesson has stuck with me and I try to do my best now to operate that way by having personal interactions whenever I can.”

Conclusion
Swafford is in the third year of her electrical engineering career and has already discovered a pathway that is providing her with opportunities for professional growth and personal satisfaction. For that, she gives credit to the field engineering program of DuPont and the IAS ESW, each of which provides her a supportive network of like-minded colleagues.