Ethanol Plant Internship

Meet Starr Grabow — a biofuels technology graduate.

While enrolled at Minnesota West, Starr Grabow worked a summer internship at Central Indiana Ethanol in Marion, Indiana, a 50-million gallon per year dry-mill ethanol plant. A year later, she graduated from the biofuels technology program at Minnesota West. Read her story about the internship and what she gained from the experience.

"This summer at CIE I worked in all major areas of the plant. I worked in cook, distillation, energy, and also in the control room. When I first started in June, I was positioned in cook where I monitored and made adjustments to the process.

Some of the process adjustments included adding an antibiotic to control bacteria and various kinds of nutrients for the yeast. I also made yeast props which were done at a specific spot in the fill cycle. The yeast tank is where the propagation of yeast is done. Each fermenter receives the contents of one yeast tank to inoculate the fermenter with yeast. Each time a yeast tank is sent to fermenter, the yeast tank is cleaned in place to ensure it stays infection free.

Then mash is diverted from the ferm fill line to the yeast tank. Another one of my major duties in cook was doing hourly samples of liquefaction, slurry, and the ferms. Every two hours, I took samples on liquefaction and slurry. I checked the solids and pH on each of them. For each fermenter batch, there were samples at five specific times. I would check the pH and the brix, which tells the amount of sugars in the sample. This number should drop as time inside the fermenter increases, indicating sugar is being consumed by the yeast. The samples were put in a machine called the HPLC which stands for High Performance Liquid Chromatography. This machine is used to determine the status of fermentation and the efficiency of both the beer, and the side stripper column. The HPLC will test several different sugars. It also checks the acids which indicate an infection. Most importantly, the HPLC tells how much ethanol we are producing.

I then switched to distillation three to four weeks later. In distillation, I checked the water content. I did transfers from one of the tanks into to our denatured storage tanks. Every day, I fed nutrients to the methanator bugs. The bugs eat all the waste out of the water. As they do this, they produce methane. I also got to take evaporators offline for cleaning in place and then put them back online.

Then I moved to energy, where I tested the moisture on the dryers and did combustion tests to check how much oxygen and CO the dryers are sending to the thermal oxidizer. I got to do water samples on the reverse osmosis, which filters the water and cleans it. I also got the chance to shut down the dryers and start them back up again. My last few weeks here, I have been running the boards. This mainly consists of running the plant from a computer. I worked 12 hour days at CIE, and I only worked days. I worked anywhere from 48 to 60 hours a week.
By working at CIE, I have gotten hands-on experience which adds to what I have learned in school. Doing the actual hands-on work gives me a better understanding of the things I learned in class. Now I have a better visual perspective of ethanol production.

Starr worked closely with Minnesota West graduate Jeff Knutson who was recently promoted to plant manager at Central Indiana Ethanol. According to Starr, "It is beneficial for me to be working with Jeff because he was once in my shoes and he taught me certain details about ethanol that I will not be taught in school. He also gives me advice on where I can go in the future with ethanol and the steps I need to take to achieve it. It is nice to know that somebody that has taken my path down the road has been so successful."