Job Summary (Summer 2013)

Air Products, like many large companies, is a mixed bag of experiences. In the language of interns, it's the difference between feeling passionately engaged and suffering the constant doldrums of a boring, 8-5 schedule. Every summer, the human resources department, alongside a few choice senior management personnel, boldly attempts to assign over 130 interns to positions of achievement, challenge, and activity. After speaking with an appreciable number of other interns, it seems that Air Products, because of its size, struggles to appropriately assign positions for all of the interns. Quite simply, the company over-hires for the summer. What a shame that is, because Air Products, as a company, has offered me an experience like no other.

Air Products has a large intern program, which is designed to feed into a three year, rotational “Career Development Program” (CDP) for new hires. Having a chance to sample each part of the company is an opportunity for employees to rediscover their interests. Many of Air Products’ competitors create pigeon-holes for its new hires, keeping engineers in engineering positions, locking them commercial and other business functions. From a career development standpoint, this flexibility is great. Internships at Air Products are hors d'oeuvres, a quick and non-committal sample before the main, three course meal: an appetizer to settle the palate, an entrée to fulfill the appetite, and an exquisite desert that you'll want to “eat” for the rest of your life.

During my tenure, I’ve experienced process design in the engineering department of the company (GEM) in the fall of 2012 and currently, I’m working with automation and instrumentation controls in operations (GO). My current position is, more or less, a firefighting role. That is, the troubleshooting of day-to-day issues makes up a large number of the projects. Most of these issues concern the control systems which monitor plant automation. This process happens in multiple tiers, involving big pieces of equipment, valves, and software logic. While some projects involved monitoring current systems, opportunities to rollout upgrades to existing platforms was an appreciable part of my day-to-day schedule.

An apt analogy is taking a shower. The water can run too hot, too cold, or too fast. Instead of manually adjusting the knob to find an optimum position, can we automate this search? By installing a thermometer on the shower head and having it communicate to the knob below, we can program this to deliver the perfect temperature with efficiency, speed, and consistency. If you think this all sounds pretty good, then the chemicals industry would agree with you. Plant automation was an initiative to improve operability, safety, and performance. Process controls is something taught in classes, but only on a very broad level. I was able to
overcome the steep learning curve my asking senior members for assistance and direction. And by the end of my short 12 weeks with the company, I was able to start training and assisting newer members of my group.

The best feature of this job was the heightened sense of responsibility. Tasked with making online changes to running plants, I learned a lot from my mistakes and grew tougher skin to challenge myself even further. Yet the best feature was sometimes the worst one. The scope of projects means that I had to quickly come up to speed. This involved a lot of hard work and dedication to gain mastery of all the tools used by my group.

Outside of work, Air Products does a good job at organizing events: sports, volunteering events, and social gatherings. The company contributes a lot to the community, but the suburban sprawl can be an issue for most people. The public transportation exists, but does not cover much area. There are no sidewalks for getting place-to-place via foot either. This summer, I ended up commuting to and from work via bicycle. While great exercise, this can only be done when weather permits.

What I’ve taken away from 28 weeks at Air Products are two guidelines to live life by. The first one is that the infinite paths of life are not predetermined. There is always the choice of change. The second is that at the ends of the professional working spectrum are two types of people, one that is passionate and devoted to his job and the other that uses his career to finance the things he is passionate about. Finding an employer who also understands this can be the true litmus test for a fulfilling and enriching adult life.
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Second Summer Co-op Term

On my second Co-op work term, I had the opportunity to work for Air Products at a chemical plant in La Porte, TX. I worked in a continuous improvement group. This group looks for ways to improve performance, production, and reduce defects in Air Product’s chemical processes. To do this, the team employs a statistical process called Lean Six Sigma.

My first project was to create graphs for the Asia advance development business relations maps. These graphs are used by managers in Asia to look for potential projects for improvement and identify current issues with our chemical processes. I created both time series and cumulative probability plots of production, efficiency, purity, maintenance spending and cost of nonconformance for Air Product’s air separation plants in Asia.

With my second project, I was doing efficiency calculations for Air Products plants in North America. Again, I was creating time series and cumulative probability plots for production, efficiency, and performance. These graphs are used by Lean Six Sigma engineers to identify potential projects to improve our current process. With these first two assignments, I heavily employed the statistical software Minitab. To do this, I used my previous experience with Minitab from my engineering statistics class at Cornell but I also learned quite a lot about the software on the job.

My final project dealt with Air Product’s hydrogen pipeline in the gulf coast. Other engineers had discovered Air Products was having problems with some of the meters that collected data on how much hydrogen goes into and out of the pipeline. We could not consistently account for all the molecules of hydrogen in the pipeline. I was assigned to conduct mass balances around small units of the pipeline to isolate and identify the malfunctioning meters. With this projects, I used skills I had learned in my mass balance course at Cornell.

Because I was working at an active plants, there was significant safety training I was required to take. This training was in the form of online presentations, courses and tests. In addition to the safety training, I also took online courses dealing with the basic chemistry of the plant I was working at, diversity in the workplace, and workplace ethics. If I had questions about how to do a certain project, I would primarily ask my supervisor. When he was unavailable, there were other engineers my manager had instructed me to field my questions to.

The work I did in this group was somewhat related to work I had done at Cornell. I was briefly exposed to lean six sigma, and Minitab in my engineering statistics class. However, my projects at Air Products required I learn a great deal more about Lean Six Sigma and Minitab on the job. On the other hand, in my project dealing with the hydrogen pipeline I was able to pull on many of my skills I had learned in my mass balance course at Cornell.

Outside of the Co-op, I had a difficult time finding housing. This was primarily because my assignment was moved from Allentown, Pennsylvania to La Porte, Texas in late spring. I was
able to secure housing through the website rent.com, but later than I was comfortable with. Also the apartment was not furnished and not nearly as nice as the place I found on my first work term. Fortunately, there were a few co-ops I had worked with in Allentown the previous fall that were working the Houston area for Air Products. This meant I already had network of people my age to interact with outside of work. Air Products also provided opportunities to network with other Air Products employees through organized lunches with senior Air Product’s employees, and plant tours. Unlike in my first assignment in Allentown, a car was essential. It would have been nearly impossible to get from home to work, and other places in Houston without my own car.

The best feature of this job was the people. Anyone I contacted with questions or inquiries about informational interviews was always open and willing to help me out. Everyone seemed eager to talk with me and describe for me what they did with Air Products. My supervisor was extremely helpful in not only finding relevant projects for me to work on, but also introducing me to key Air Product’s employees in the region.

My least favorite aspect of this job was the length of the assignment. If I had a longer assignment, I could have not only worked in a wider range of projects but I also could have done more in the projects I worked in.

Despite its short length, this was a great work term. I learned a great deal about continuous improvement and Air Products. I would be honored and immensely pleased to be offered a full time position at Air Products.
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Summer 2013

A. Work Assignment

This summer I continued my co-op working for Air Products and Chemicals in the Pressure Vessel operations group. My group was mainly in charge of the upkeep of pressure vessels (reformers, process gas boilers, etc.) at field locations. This group was in charge of overseeing repairs, documenting inspections and replacements of parts and ensuring reliability of operational vessels.

As a part of the group I had the chance to work on several different tasks. These included: creating outage reports from a string day-to-day blog entries, creating a history log for tracking work done on equipment in the field, comparing risk based inspection ratings between plants, analyzing corrosion of an oil storage tank, and attending a plant outage in Hannibal, MO. Before each assignment, I was given an overview of the task and direction on how to get started. Additional safety training for the office and Missouri site was Internet-based. Training courses consisted of slide show presentations with short tests at the end. My assigned mentor was my supervisor Bun, and she gave me direction for most of the projects I was involved in. I also had a chance to work with some other members of the group when compiling outage reports and traveling to Hannibal.

B. Assessment of Learning and Development

My work activity related to my educational background and career interests very well. I learned a lot about professional mechanical engineering and the gas production industry over the course of my term. I worked with American Petroleum Institute (API) and American Society of Mechanical Engineering (ASME) standards to calculate design life and suitability for service. With this I was able to build on my knowledge of basic Excel formulas and perform hand calculations before making informed decisions as to recommendations for continued use and lifespan of equipment. I had a chance to take a trip out to Hannibal during an outage and see pieces of equipment first hand. While on site I was able to observe the repairs being made by our third party contractors, interact with field team members and go through confined space training before entering the reformer for an inspection. Back at the office, I was also able to build a stronger foundation in my skills with advanced functions in Microsoft Excel (Macros and VBA) which will no doubt be useful in any future career.

This position influenced my professional development in a very positive way. Working with Air Products in the Fall 2012 term, I was able to learn a lot about the upkeep of plant computers and the development of complex networks between them. I wasn’t however able to apply much of my knowledge related to Mechanical Engineering to that role. This term was completely different, and I could see applications from the classroom in many parts of my job. For instance, in MAE 3272 we worked a lot with ASME standards when performing hardness tests and strain gauge tests. While the focus of the codes I dealt with during my work term were more applicable to industry, it was good to be able to have a little bit of background knowledge with codes and build on my experience. Through my position I was given a good amount of responsibility for the work I was doing. Templates I created were designed to be used other
team members in the field and analysis I performed led to direct recommendations regarding operations of equipment.

C. Life Outside of Co-op

Since I worked at Air Products in the Fall, I already had a good idea of where I wanted to live. I ended up renting a townhouse with two other interns I met in the fall from an employee in California. It was great to be able to have the independence of our own house and our commute to work was less than 2 miles. Living in the Allentown area, a car is really a necessity if you want to be able to get around by yourself. There were around 100 interns working at headquarters for the summer though, so provided you lived close to someone, finding a ride would not be too difficult. One of my roommates didn’t have a car, and always managed to get where she needed to go.

With the large number of interns in the area for the summer, there was plenty of opportunity for social activities. We took a few trips to Philadelphia, went whitewater rafting, played mini golf, went to a local AAA baseball game (with free tickets from Air Products) and watched some drive-in movies (again discounted by Air Products) to name a few. Bethlehem, the next town over, also had a weeklong event called Musikfest that we frequented a couple times. Generally, there was never a shortage of things to do if you didn’t mind being a little creative.

Air Products also offered plenty of opportunities to get involved on campus with athletics. They have an on campus gym which I joined for the summer. It was really convenient because I could just bring a change of clothes with me to work and head the gym at the end of the day before going home. They also had a variety of intramural teams for the summer. I joined the intern intramural volleyball team and had a great time playing after work once a week. It was really laid back and a great chance to network with other employees after work. A group of interns also founded an Ultimate Frisbee league, and I played that once a week as well.

D. Evaluation

The best features of the job were the ability to travel and use technical mechanical engineering skills. Traveling and interacting with people in the field was absolutely one of the best parts of my summer experience. Working in the office is nice but the amount of knowledge and appreciation for your job that you gain by visiting the field is invaluable. I really enjoyed seeing a plant first-hand; being able to climb up ladders and personally inspect boilers, crawl inside a reformer and see what it actually looks like, and finally climbing to the top of the reformer and looking at the plant from above were all very exciting parts of my field experience. Of course appreciating the local culture and food of the area was pretty cool too.

Secondly, I liked being involved in some technical engineering work. Being able to pull out my calculator and crank out some calculations was really rewarding for me. After spending three years in college studying, it was nice to actually be able to apply some of my skills. Problems in the real world are a lot more practical than those from engineering classes in school, so the calculations are a lot simpler but you have a lot more unknowns. This creates a unique challenge that I enjoyed a lot.

As far as worst features of the job go, there weren’t very many negatives. I really enjoyed the work I was involved in this summer. Sometimes looking at the same spreadsheet for a while could get mundane, but I don’t think it’s fair to assume that any job could really be
without such tasks. At first I was disappointed to not get a job in a Gulf Coast location like I had requested, but ultimately spending the summer in Allentown was great for me.

E. Additional Info

The summer before senior year, Air Products offers all interns the chance to interview for a full time job. It involves an exhausting eight hour day filled with multiple one-on-one interviews followed by a problem solving test, group discussion and short presentation. It’s a great opportunity and one I would definitely recommend participating in. If you have any questions about working for Air Products or co-op in general, feel free to message me at mmp84@cornell.edu