

Eastman Chemical

Electrical Engineering Internship Portfolio

1 Description

Participate in a highly organized internship program of around 125 students from a variety of majors and universities. This program highlighted different aspects of the Kingsport plant through placement on a team, networking events, plant tours, and term presentations. During the work term students were introduced to Eastman culture and the responsibilities of all Eastman employees.

2 Centralized Maintenance & Services – Electrical Reliability

For my term I was placed on the Electrical Reliability team in the Centralized Maintenance and Services division. The majority of my team's ongoing projects focus on maintaining the health of the electrical infrastructure throughout the plant. This involves analysis of current systems as well as comparing these systems to other technologies that could be utilized. My team is also involved in monitoring of possible points of failure in current processes and investigations of any malfunctions that may occur.

3 Projects

During my internship I completed several projects as well as shadowing my team in some of their routine tasks. I was exposed to areas all over the plant and the different aspects of electrical engineering and reliability utilized in the different divisions.

3.1 Drive Research

Drives are used throughout the plant in many different applications. The first couple weeks of my internship dealt with learning how drives function, the circuitry involved in them, and the different types of drives currently on the market. After studying the basics of inverter drives as well as researching the common failures I also studied other types of drives and the effects the differences in design had.

During this project I was also given the chance to accompany my team during “forensic examinations” of drive failures. I was able to see firsthand the typical failure points in drives as well as the applications of the circuits I'd been studying.

3.2 Power Panel Replacement – Recommended Groupings

In order to maintain the health of Eastman's electrical infrastructure, the reliability department was promoting power panel replacement projects throughout the plant. Current procedures allowed many deficient panels to be caught and fixed before they cause

major damage to plant procedures. However, this process allows panels to become obsolete presenting a high possibility of delayed production if deficiencies aren't caught and failures occur.

As a way of promoting these replacement projects I was tasked with separating panels into bulk groupings to create more economical projects. For the most part these bulk groupings were panels that were all in the same electrical room, specified by functional location. After all the groups had been identified a priority was assigned to each one based on the age and number of the panels in the group. The result of this project was a spreadsheet with all the groups that could be filtered by division.

3.3 UPS Alarm Tags

For this project I was tasked with examining elementary diagrams of Uninterruptible Power Supply systems and noting any alarm tags specified for each system. Some of the conditions being monitored include Static Switch Transfer, Battery Supply Load, Bypass Source Failure, Fan Failure, Low DC Voltage, and Battery Breaker Open.

3.4 Team Tasks

- Rotor Influence Check

A rotor influence check involves turning the rotor of a motor by predetermined increments while taking three phase to phase induction readings. The result of this is a graphical representation between the stator and the rotor. My team uses these tests as a way to monitor changes over time. By examining characteristics of the output graphs different defects in the motor can be identified and fixed.

- Root Cause Analysis

A unique process I was able to observe during my work term was the method of determining root causes of different failures in the systems throughout the plant. This involved examining mechanical failures, human mistakes, and different latent behaviors that may have contributed to the failures. This process emphasized looking not only at short term solutions for the unique process involved but also long term solutions and applications to any related processes throughout the plant.

- Power Sag Events

My team worked on testing relays for performance under power sags. This involved reducing the input power to the relay to 90% or less of typical power for various numbers of cycles. I was able to learn about power sag events and the capabilities of the different relays.

- IR Panel Scans

As a way to maintain health of the electrical infrastructure of the plant my team completes annual infrared scans of power panels in the plant. I was able to observe a couple of these scans as well as learn about the different warning signs for panel failure.

4 Events and Experiences

Working for a chemical company as large as Eastman was a very new experience for me. Due to this I was able to observe and participate in several exciting events and experiences.

4.1 Safety

The biggest emphasis throughout my term at Eastman was safety procedures within the plant. My first tasks included completing the overall safety training including personal protective equipment, chemical hazards and signage, driving and parking on Eastman property, emergency plans, and department safety procedures. Different safety concerns and observations were also discussed at our weekly team meetings and department safety meeting. East's policy is All in for Safety and it was certainly reflected throughout all of the practices I saw throughout the plant.

4.2 Networking Opportunities

One of the things widely promoted throughout Eastman were opportunities to network with other Eastman employees. As interns we were encouraged to speak with interns, new hires, and employees about their experiences with Eastman and the projects they were working on. We were given countless opportunities to network at intern lunches, Eastman Professional Development Club – New Employee Welcome events, and tours of different plant areas. Near the end of my term I was invited to a ME/EE picnic put on by Worldwide Engineering & Construction. This was an amazing opportunity because it gave me the chance to talk with and get to know the leadership teams from the primary hiring entry point into the company.

4.3 Day of Caring

One of the most rewarding experiences had the opportunity to participate in was United Way's Day of Caring. As a way to give back to the surrounding communities, Eastman encourages its employees to participate in volunteering events going on around the tri-cities. I was fortunate enough to work with a team helping out Frontier Industries with several of their more time consuming tasks. Frontier Industries works to help empower people with disabilities to achieve their highest level of integrated living. We helped landscape to maintain bushes and trees on the property, wash and clean out cars, and paint poles to increase visibility. It was a great way to interact with my coworkers outside of the office while also helping a valuable staple in the community.

4.4 End of Term Presentations

As a conclusion to my work term at Eastman I was asked to complete a presentation highlighting the different projects I worked on during the summer. This provided me the chance to showcase the assignments I worked on to other interns and full time employees. I was also able to learn about what projects the other interns completed including those outside of my discipline.