

Executive Summaries

2009-2010 Bursary Vacation Placements in South Australia

List of Executive Summaries		
Student	Company	Page
2007 Bursary Holders		
Brown, Stefan (UA)	Electranet	2
Burke, Lucy (UA)	AGL	3
Parsonage, Eric (UA)	AGL	4
Plich, Konrad (UA)	ETSA	5
2008 Bursary Holders		
Barley, Andrew (UA)	SKM	6
Daly, Thomas (UA)	Electranet	7
Fernandez, Azul (UA)	Electranet	8
Pemberton, Thomas (UA)	Electranet	9

STUDENT: Stefan Brown (UA)

COMPANY: Electranet



From the 23rd of November 2009 to February 24th 2010 I took part in vacation work experience at ElectraNet, Adelaide, South Australia. This work experience was organised through the Australian Power Institute Bursary Program. ElectraNet is the principal transmission network provider in South Australia. The objectives of the vacation employment were to gain experience working in a professional engineering company, exposure to project management and technical knowledge of the power transmission industry, in the context of a private, regulated utility company.

My position within the company was in the Project Construction business unit. Project Construction manages projects during the construction phase of projects and then facilitates the handover of the project to the customer. My primary role was to assist one of the graduate engineers in their construction management and project consulting on two main projects. I was also responsible for some drawing management with the drawing management officers.

The first project was the installation of a new switchboard for the substation auxiliary supplies at the Mt Barker substation. This site is a pilot site for the installation of new switchboards at several ElectraNet substations in the near future. The second project was the up-rating of cables at the Roseworthy substation. This was an unregulated project for a direct-connect private customer requiring an 11kV power supply, the AMCOR glass factory. Both projects required the use of project management methodologies, contractor management, construction planning and management as well as the solving of technical engineering problems.

Overall, my work experience placement was a valuable opportunity to gain experience and technical knowledge of the power industry and transmission networks, and I achieved the objectives I had set out to. Based on my impressions of the company during this employment I would return to ElectraNet in the future.



Energy in action®

STUDENT: Lucy Burke (UA)

COMPANY: AGL

During the period of December 2009 until February 2010 I undertook engineering work experience at AGL's Torrens Island Power Station. Torrens Island Power Station (TIPS) is a gas-fired plant with eight steam turbines resulting in a total generation capacity of 1280 MW. The objectives of the work placement were to gain experience in a working environment as a power engineer, broaden my knowledge of the power industry, gain technical knowledge of power systems and improve my skills in written communication of technical ideas.

During my time at TIPS, I assisted a number of the Asset Management engineers in their work on various projects and tasks along with another work experience student, Eric Parsonage. Some of these projects included reviewing compliance with standards for cranes and lifting beams, proposing a suitable system for the safe containment of hypochlorite/hydrochloric acid in case of leakage, calculations to determine hazard levels of pressure piping and vessels and an improvement investigation for the whole of TIPS. I was also given the opportunity to spend three days on shift in the control room with the operators and had the chance to attend a variety of courses, meetings and activities. These opportunities added to the overall experience and gave me an insight into what would be involved in a day-to-day engineering job.

My overall experience at TIPS was very positive, and extremely useful towards my future in the power industry. I particularly enjoyed being able to apply what I had learnt at university in a practical situation as it reinforced my theoretical knowledge that I had gained at university. Through the participation in practical projects, I was able to improve my problem solving skills and I now approach problems in a more effective manner. I would recommend undertaking work experience with AGL at Torrens Island Power Station to any engineering student interested working in the power industry.



Energy in action®

STUDENT: Eric Parsonage (UA)

COMPANY: AGL

During the work experience period of the summer of 2009/2010 I resumed full-time work with AGL at Torrens Island Power Station (TIPS). As I had worked at this site before, and had been continuously employed on a part time basis since the conclusion of the 08/09 work experience period, my duties and responsibilities were generally extensions of the projects and areas I had been working with for the previous year.

As I am officially a member of the “Asset Strategy” group, my work involved: preliminary project work on two projects, analytical calculation in response to regulatory requirements, fault finding and diagnostic engineering work, and project and contract coordination. In addition to my usual work I was tasked with the more open-ended question of potential improvement initiatives that could be created at Torrens Island Power Station.

Generally, the work provided at Torrens Island Power Station continues to be pertinent and essential in my development as a budding power engineer. The breadth of skills and knowledge that safe and continued operation of this power station requires challenges me on a regular basis as I continue my employment with AGL into a second year.

STUDENT: Konrad Pilch (UA)

COMPANY: ETSA Utilities

I undertook work experience at ETSA Utilities from November 2009 until February 2010. My position was as an undergraduate engineer in the Quality of Supply group under the supervision of Anthony Bickle and under the management of Grant Rice and Paul Driver.

The work experience was structured in such a way to maximise my learning experience with the first few weeks involving intensive training of the procedures, practices and standards involved in the management, maintenance and upgrading of the low-voltage network operated by ETSA Utilities.

Following training was a period of time during which I would be undertaking the jobs under the supervision of relevant employees. At this stage, I was fortunate to get involved in field work (checking suitability of infrastructure for designs (such as location, pole size, cross-arm strength, tree clearance), inspecting the infrastructure (transformers, poles, conductors, cables, cross-arms), as well as testing transformers and customers' supply), design work (design of solutions, drawing them using software such as Caddsmen, doing estimations of cost and confirming with line crews of the suitability of design) and administrative tasks (archiving, filing, setting up spreadsheets of data, checking for duplication, setting up jobs, updating the status of jobs, liaising with Network Project Officers).

Additionally, I completed many jobs in the role of a LV Planning Engineer and Quality of Supply Analyst, eventually doing these jobs on my own. My job was to overcome the myriad of problems that the network can experience including low voltage, high voltage, flicker, variation, overloaded transformers/conductors/cables, harmonics and shock. The many different types of problems require varied solutions such as putting infill transformers, upgrading transformers, balancing phases of a transformer, replacing infrastructure, extensions of HV/LV lines, as well as upgrading cables/conductors to name only a few.

In the process of working in this position, I was required to analyse the problem using sophisticated software, interpret the results, come up with solutions, draw up the design solution, make calculations to confirm the design is within Australian and ETSA Utilities standards and follow up tasks involved in getting the job completed, such as liaising with the appropriate personnel.

The placement worked very effectively to increase my understanding of the electricity industry and how ETSA Utilities operates, as well as introducing me to engineering practices and what will be expected of me as a professional engineer.

STUDENT: Andrew Barley (UA)



COMPANY: SKM

This report outlines the work experience I had at Sinclair Knight Merz (SKM) over the past summer. The main project I worked on was automating the process SKM uses to model Adelaide's tram network. I also assisted in assessing the regulatory value of seven ETSA Utilities projects for the Distribution Lessor Corporation.

Most of the work I did was for a power study of future expansion of Adelaide's tram network. My task was to develop software in the java programming language to automate parts of the modelling. The input to the software is a spreadsheet of tram locations throughout time, which is generated separately using the DTEI timetables. Values from the spreadsheet are used to adjust parameters in an electrical model, which is simulated with the SIMatrix SPICE simulator. The model incorporates all features of the network including trams, rectifier stations, overhead lines and feeder cable. Graphs of the results are automatically generated using a template spreadsheet.

ETSA Utilities (EU) currently leases the SA distribution network from the government. As part of this EU routinely submits projects it believes are Qualifying Projects (significant upgrades over a certain cost threshold) to the DLC which gives its approval as appropriate. These parts of the network then belong to EU. I was involved in assessing the regulatory value of the projects. This was done by looking through EU board papers and single-line diagrams. Various databases were referenced to produce the final cost estimates.

I was very satisfied with the experience I gained at SKM. All of the tasks set out for me were directly applicable to my coursework as well as relevant to the work being done by others around me. I learnt much that will be applicable when I enter the industry.

STUDENT: Thomas Daly (UA)

COMPANY: Electranet



The purpose of this report is to demonstrate my experience of my vacation employment at ElectraNet as part of the API Bursary Program. My time spent at ElectraNet was most informative and in my opinion, a great opportunity to learn what engineering is like after university. I was assigned to a senior project consultant in the development and projects division. There were three other students, all on the API Bursary who were assigned to other divisions in the company. The role of the development and projects division is to plan and execute projects to aid the development of the electricity transmission network in South Australia.

In my time there I helped with and observed the projects my 'mentor' was working on. My tasks however were not limited to one person and I received work from other employees if I had time on my hands. This enabled me to get a great outlook of how the division works, not only within the division but within the company as a whole. Some of the tasks I conducted included checking of technical plans, cost data analysis, site visits, research projects, longhand checking of calculations, writing up reports and many others. While dealing with these tasks I encountered challenges due to numerous things such lack of knowledge or miscommunication but the people in the division either helped me themselves or gave me the tools to overcome the challenges myself.

Overall I found my experience at ElectraNet over the summer to be most satisfying. The knowledge and experience I have gained will no doubt be helpful to further my power engineering career. I thank the API Bursary partners and ElectraNet and would encourage anyone who gets the opportunity to partake in vacation employment at ElectraNet.

STUDENT: Azul Fernandez (UA)



COMPANY: Electranet

The purpose of this report is to provide the Australian Power Institute with a written document to highlight the learning and experience gained at the work placement offered by ElectraNet Pty. Ltd over the university summer vacation November 2009 to March 2010.

This document reflects in summarised form, all aspects of the company that were encountered by the API bursary holder, Azul Fernandez.

During my placement I was assigned two major research projects. These projects involved research in the area of underground coal gasification processes, and in the area of large- scale solar energy storage. Both projects required extensive research in areas where the information is not readily available, thus making it challenging and time consuming, yet very informational. To finalise the projects I was required to give thirty minute presentations to the board of the Business Development division, as well as the Customer Portfolio division.

In addition to the research projects, I was taken to some of ElectraNet's substations, and received a very detailed explanation of the need and role of some of the substation's components. Being in second year of engineering it is not common to get exposed to power generating technologies, so having an early introduction to them, and learning what the purpose of each piece of equipment in the substation was, definitely made work experience worthwhile and very informational. During a visit to one of the substations, the Hallet Hill wind farm was visited. Visiting the wind farm was just as rewarding as every other task given to me during my placement.

Having completed a work experience placement at ElectraNet has not only fostered a stronger interest in the power industry, but allowed me to gain valuable technical knowledge from the transmission industry.

STUDENT: Anthony Permberton (UA)



COMPANY: Electranet

Over the 2009/2010 university summer vacation, I was offered to work as a Vacation Student at ElectraNet. ElectraNet is South Australia's primary Transmission Network Service Provider (TNSP). They own and operate a transmission network of 78 substations and 6000kms of line, moving 14,000GWh per year with an asset worth of around \$1.5 billion AUD. I gladly accepted the offer and was placed in the Asset Integrity team in the Assets & Operations division.

During my time working at ElectraNet, I was given a variety of work to do, all of which posed different problems and challenges. I was assigned to create spreadsheets on circuit breakers, such as ones for looking at switchgear condition and also graphing operations versus time in order to find trends for extrapolating, as well as other spreadsheets summarising surge arresters and lines testing. I had the opportunity to help do some protective relay testing, which involved testing an old electromechanical relay to familiarize myself with the process before testing a modern digital differential relay, simulating a real fault that occurred on the network. I was fortunate enough to visit three substations, in Dry Creek/Kilburn, Tailem Bend and Torrens Island Power Station; I got to see the equipment I had been working on with my spreadsheets for real, as well as lots of other high voltage devices which was a great experience. Learning a new CAD computer program for updating some wiring diagrams was a big challenge for me but after spending some time with it, learning as I went along, I became quite proficient at using it.

My time with ElectraNet was an absolutely invaluable experience; I learnt a great deal and enjoyed my time working there very much. I can definitely see myself working as a power engineer in the future.