# Executive Summaries

## 2011-2012 Bursary Vacation Placements in ‘South Australia’

## List of Executive Summaries

<table>
<thead>
<tr>
<th>Student</th>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2009 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Griffith, Lucy (UoA)</td>
<td>ElectraNet</td>
<td>2</td>
</tr>
<tr>
<td>Kuppa, Karthikeya (UoA)</td>
<td>AGL</td>
<td>3</td>
</tr>
<tr>
<td><strong>2010 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>McDonald, Cathryn (UoA)</td>
<td>ElectraNet</td>
<td>4</td>
</tr>
<tr>
<td>Mohabuth, Munawwar (UoA)</td>
<td>AGL</td>
<td>5</td>
</tr>
</tbody>
</table>
The purpose of this report is to summarise my experience of a Vacation Student Engineering Placement with ElectraNet over the summer of 2011-12 as well as to demonstrate the learning that took place over that period. ElectraNet is an electric power transmission company based in Adelaide and is the principal Transmission Network Service Provider for the state of South Australia.

I was placed with the Adelaide Central Reinforcement Project Team at ElectraNet. This was a great opportunity for me to work with some very experienced engineers and project managers. I was given many tasks during my placement, most of which were connected to the project. Those tasks included: document review, electromagnetic field analysis, cost estimation and cable patrol. These are detailed in the main report. Through the completion those tasks I was able to gain a much greater understanding of power transmission as a whole and aspects of it. Non-technical learning such as office etiquette and inter-organisational processes was also a valued part of my learning experience during the placement.

There were a number of exciting aspects to my placement with the team at ElectraNet. These included networking at the various Christmas events, watching a large transformer being re-energised after a day of maintenance and following an underground cable from end to end learning about the engineering challenges faced during their installation. These experiences and the valuable knowledge gained during the Vacation Placement have fired me up and equipped me for learning more about power engineering through study and employment in the future.

I found my experience during the Vacation Student Engineering Placement with ElectraNet incredibly valuable for increasing my understanding of the power industry in South Australia. I would recommend it to any engineering student with an interest in the power industry.
STUDENT: Karthikeya Kuppa (UoA)
COMPANY: AGL

During the period of 10th January 2012 to 24th February 2012 (7 weeks) I undertook my work experience at the Torrens Island Power Station (TIPS) which is owned and operated by AGL Energy Ltd. TIPS is a Natural Gas fired power station and is capable of generating up to 1280 MW. The objectives of the work experience were to gain an understanding of the various roles and responsibilities of an engineer, familiarise myself with the process of power generation at a Natural Gas fired power station and to improve my communication and technical writing skills.

The purpose of this report is to provide the Australian Power Institute (API) and its Stakeholders an insight into the work experience I gained at TIPS. This includes the type of work I performed and the structure of the vacation placement.

My work experience involved me working with different groups within TIPS to give me an understanding about all the different roles and responsibilities of all the employees at TIPS. The groups I worked in are: Centralised Asset Management, Operations, Electrical Maintenance and Engineering. For the majority of my work experience at TIPS, I was given a set of projects to work on. One of the several projects was the review of a control system for the Emergency Fire Protection. As part of the project I had to also review the compliance of the Fire Protection for the step-up transformers in the B Station. I was also the engineer for the installation of protective structures for a transformer. As part of my work experience at TIPS, I had to write several technical documents such as Project Authorities and an Operating Instruction Sheet (OIS) for an Automated Hydrogen Drier System. This required me to read its instruction manual and call several external companies who have had experience in this. This improved both my technical writing and communication skills.

During these 7 weeks of work experience I worked with many people and had the opportunity to understand the roles and responsibilities of each person and group and throughout this process I had gained a good understanding of power generation and the various techniques used. This practical knowledge will definitely make it easier for me in my final year when I learn more about power generation and its technologies.

My work experience at TIPS has been very positive and rewarding. This work experience will be very useful for me in my future within the Power Industry. It has been rewarding because it enforced my interest in the Power Industry. My involvement in different projects presented me several opportunities to improve my communication and problem solving skills. I have enjoyed my work experience at TIPS and would definitely recommend TIPS as a work place to anyone wanting to work in the Power Industry.
In the summer of 2011/2012 I undertook work experience at ElectraNet, in the Network Dynamics team. The Network Dynamics team carry out steady-state and dynamic analysis of the South Australian power system to determine its stability under a variety of conditions.

My main tasks while at ElectraNet were to learn about fields of power engineering relevant to Network Dynamics and gain experience with relevant software, and to assist in studies through setting up base cases and interpreting results.

Through these tasks, my knowledge in many fields of power engineering was increased, particularly in the field of power system stability. I have gained a greater understanding of how the SA power system is usually operated, and the major influences on its stable operation. I have gained experience in the software used to analyse the power system at ElectraNet: PSSE and AULimit, and through this my understanding of the use of numerical methods of simulation has increased.

I have also improved my skills in communicating technical information, particularly graphically, and in gathering information from various sources including technical manuals. My problem-solving and experimental skills have also been improved.

Through this work experience I have become better prepared for future study in engineering and physics, and for future employment in the field of power engineering.

I would like to extend my gratitude to the Australian Power Institute and to ElectraNet for the opportunity to undertake this work experience.
During the summer vacation, I had the opportunity to undertake a 11 weeks work placement with AGL, thanks to the API Bursary Program. It was based at the Torrens Island Power Station where I worked in the Merchant Operations (MO) section, which is responsible for the management of AGE’s generation assets and hydrocarbon extraction plant. Therefore, I was able to assume different roles and responsibilities across several departments including Operations, Maintenance and Central Asset Management. This report highlights the major projects I have worked on, the experiences acquired and the outcomes of the placement.

This placement has enabled me to get an invaluable insight into how a power station is managed. The work is not limited to routine maintenance but there are multiple challenges due to the ageing assets. This offered me the unique opportunity to work on the Remnant Life Assessment of the “A” Station in order to determine the optimum strategy for future operational and maintenance plans. This exercise enabled me to experience the whole of life asset management, including budgeting, planning and strategy development.

Due to the growing asset portfolio in MO, an asset management transformation program, based on the British Standards Institution (BSI) publicly available specification (PAS 55), was being implemented. This was done in order to optimize the management and maintenance of the assets over their entire life cycle. I had the opportunity to help in developing an asset information management system called the Asset Condition Record, which will be used for maintenance strategies development, streamline budgeting and planning.

Furthermore, I was involved in developing a strategy for a secondary superheater outlet header, in terms of a maintenance plan and the potential replacement of the header. To do so, I had to gain a better understanding of non-destructive testing procedures, including Magnetic Particle Inspection, Ultrasonic Testing and Replication. The projected cost of repairs and potential replacement also had to be estimated. In order to decide on the optimum solution, I had the opportunity to learn financial concepts such as the Net Present Value and the Internal Return Rate.

These projects have undoubtedly helped me develop an understanding of the complexity of running a power station and the challenges of a good asset management system. I have been able to improve my communication skills, both in terms of report writing and oral presentation. The experience has also helped me build upon my analytical and planning skills which will certainly be beneficial in my future career.