# Executive Summaries

2011-2012 Bursary Vacation Placements in ‘Western Australia’

## List of Executive Summaries

<table>
<thead>
<tr>
<th>Student</th>
<th>Company</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2008 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robert Palmer (UWA)</td>
<td>Alliance Power and Data</td>
<td>2</td>
</tr>
<tr>
<td>Gloria Rupf (Murdoch)</td>
<td>Western Power</td>
<td>3</td>
</tr>
<tr>
<td><strong>2009 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Michael Wesley (Curtin)</td>
<td>Western Power</td>
<td>4</td>
</tr>
<tr>
<td><strong>2010 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kara Symes (Curtin)</td>
<td>Western Power</td>
<td>5</td>
</tr>
<tr>
<td>Jamie Batson (Murdoch)</td>
<td>Western Power</td>
<td>6</td>
</tr>
<tr>
<td>Sahan Amaratunge (UWA)</td>
<td>Western Power</td>
<td>7</td>
</tr>
<tr>
<td><strong>2011 Bursary Holders</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kayle Gelmi (Curtin)</td>
<td>Rio Tinto Iron Ore</td>
<td>8</td>
</tr>
</tbody>
</table>
STUDENT: Robert Palmer (UWA)
COMPANY: Alliance Power and Data

Over the course of my three month placement at Alliance Power and Data (APD), I have developed a greater appreciation of the scope and breadth of the power engineering field.

During the placement, I was a member of several of APD’s teams. I undertook several projects, including soil resistivity tests, the analysis of overhead line structures, and designing underground power reticulation for green-fields developments. This has led to the acquisition of a variety of technical skills, principally; drafting; reading and designing to standards, and increased knowledge of those standards.

I have also learnt many non-technical skills. I have developed a better understanding of the need to integrate business needs and requirements with the engineering design process, management of intellectual property issues, and how to manage and assess risk and safety hazards. As a result of this learning, I feel better equipped to undertake further work and study as a member of the engineering profession.

I wish to express my sincere gratitude to the Australian Power Institute and APD for this valuable experience.
This report outlines the knowledge I have gained and my experiences whilst undertaking Vacation Employment at the Transmission Lines Design Section (TLDS) of Western Power. The report demonstrates how these experiences have played an important role in my professional development, particularly in improving my communication, research and technical skills.

Western Power is the state owned electricity network corporation that constructs, maintains and operates the electricity network in the south-west region of Western Australia (1). The Transmission Lines Design Section designs new transmission lines and modifications to existing lines as well as conducting easement and clearance calculations.

The project I was given during my ten weeks at Western Power was to develop a preliminary spreadsheet and supporting document for conducting clearance calculations. The purpose of the spreadsheet is to improve the efficiency and accuracy of the clearance calculations. Before I could start developing the spreadsheet, I first needed to learn how easement and clearance calculations were conducted. I was assigned a few clearance and easement calculations which enabled me to put to practice the methods I was taught. This was followed by research on the different methods of calculating the conductor sag for an inclined span. Based on this research, two different methods for calculating the sag were tested for a range of different spans. While the results showed that both methods had a high accuracy, one method involving the use of catenary equations and Pythagoras’s theorem, was found to be more suitable to be used for the spreadsheet. This method was then used to develop the clearance spreadsheet and a supporting document which outlines the method used in the spreadsheet. The spreadsheet and supporting document will be reviewed and tested by the senior electrical engineers at the TLDS prior to being used by the engineering staff to complete clearance calculations.

I thoroughly enjoyed my vacation work placement with the Transmission Lines Design Section of Western Power and feel that it has been an important part of my professional development as an engineering student. The project I was given enabled me to practically apply my research and mathematical engineering skills that I learned at university. It also challenged me to sharpen my understanding of the structural and mechanical aspects of transmission lines as well as aiding me to develop my technical communication skills which I recognise as being essential for practicing power engineers.
Western Power is an electrical utility company in Western Australia responsible for the systems and networks that transport electricity from generating companies to residential, commercial and industrial customers.

During the 12 weeks of my vacation work at Western Power, I was fortunate to gain exposure to a few different projects within the area of transmission lines. The aim of this report is to give an insight into my experience with Western Power in regards to the work I completed as well as the skills developed during my placement.

The main challenges that I was presented with, during my placement, were in regards to easement and clearance calculations, to be provided to the land development section. These calculations represent safety measures that need to be met to ensure Western Power employee and general public safety, at all times.

I would like to thank the Australian Power Institute and its partners, including Western Power, for allowing me to partake in work experience over the 2011-2012 summer holidays.
STUDENT: Kara Symes (Curtin)
COMPANY: Western Power

Over the course of my three month employment at Western Power’s Customer Network Connections branch, my technical and non-technical understanding of Western Australia’s power sector has increased, and the position has better equipped me to further my studies in the field and eventually work in the power sector.

My role as a designer in CNC’s Metropolitan Business and Residential team involved completing estimates, designs and quotes for customers looking to relocate Western Power assets, connect to the power grid or simply upgrade or remove their existing supplies.

Mainly, I was involved with determining estimates for the customer and completing preliminary designs that would then go on to a detailed design phase at a later date. This involved analysing the current state of the power grid in the area and determining how a job would be completed.

Through my position, I gained an understanding of the complexity and the vastness of the SWIS network in WA, as well as how to design not only for now, but for future projects. I also gained an understanding of the infrastructure of the distribution network, and the parts and components of which it is composed. I also gained an understanding of the costs of projects within the network. In addition to this, I was able to improve my research skills, office etiquette and professional conduct with other colleagues and external parties. All of these skills I plan to improve further still and use once I start my career in the power sector.

I would like to extend my sincerest gratitude to the API and to Western Power for giving me the opportunity to participate in the 2011/2012 Summer Vacation Program and gain an insight into what is, and is set to become, a more and more exciting industry to be a part of.
In the summer of 2011-12 through API I was fortunate enough to obtain vacation employment with Western Power in my second year of the bursary program. My three month employment was based at their Head Office location in the Central Business District (CBD) of Perth. Through this placement I was able to improve my understanding of the electrical power industry and gain an understanding of the concerns which exist in different sections of the power industry.

The position I was given was within the Secondary Systems Engineering branch of Western Power under the “STEP” team. The Secondary Systems branch allows the power network to be controlled in a safe and efficient manner through schemes which protect people and property. The STEP team is responsible for the creation of the new Substation in Balcatta which is unique to previous substation designs within Western Australia as it employs the use of the IEC61850 Standard. I found this to be a unique opportunity as I was able to work with a team which was a cross-disipline of individuals within secondary systems which collaborated in order to implement this substation design.

The task which I received was to create a data visualization framework. This framework was to allow for practical and effective viewing of information, such as that which will be available through the substation being commissioned at Balcatta. The IEC61850 design will provide improved connectivity at Balcatta, which improves the amount and quality of the information from the substation which will be available. This information could be useful in applications throughout the power industry such as maintenance of equipment or sequence of events use.

Overall I found my experience at Western Power extremely beneficial in developing well-rounded skills which are invaluable for my career development. The completion of this project relied on enhancing my communication skills and called for technical skills such as programming ability and extracting database information to be practiced. A stronger understanding of the structure of the power corporation and the roles of various sections within the company was also gained through team meetings and consultations with the tasks stakeholders. This role set up a prime opportunity to be able to think and problem solve like an engineer.

I am extremely grateful to API for setting me up with this opportunity early into the bursary program. I would like to especially thank the STEP team and Western Power for giving me the opportunity to develop my understanding of the power industry with them. This opportunity has solidified my interest in electrical power and I look forward to rejoining the industry as a graduate engineer in the future.
During my 12 weeks of vacation employment in the Western Power Head Office, I came to develop a solid understanding of the core fundamentals of asset management, appreciate the network of electrical infrastructure in South-West WA in greater scope, and develop a greater understanding of many of the technical, commercial and regulatory challenges present in the delivery of electrical power to customers in such a large network.

During my tenure in the Conductors Section of the Network Performance section, I undertook four mains tasks under the supervision of others in the section. I assisted in

1. The design stages of several substation installations by undertaking underground cable study requests for the proposed layouts,
2. Assisting in the design and surveying stages of a Strategic Asset Management review being conducted by a Strategic Asset Management (SAM) specialist,
3. Being involved in the initial stages of a project analyzing the aging of a decommissioned transmission line passing through a variety of environments.
4. Creating a new database for tracking the progress of conductor replacement projects in regards to cost, volume, and completion schedule, to improve upon the existing spreadsheet being utilized.

My communication, report writing and organizational skills have been significantly improved from this experience. It has also provided me with a greater understanding of the many challenges and possibilities facing an electrical engineering company as a corporate body, an understanding of the many roles and responsibilities in the company, and a newfound enthusiasm for considering future employment in the power engineering profession.

I would like to thank the Australian Power Institute Committee and Partners and also Western Power for this opportunity to be part of the Vacation Employment Program over the 2010/2011 summer.
My three-months in the Pilbara with Rio Tinto, has not only allowed me to experience the mining industry but has extensively increased my understanding of engineering practices and management systems.

The position in the Fixed Plant and Infrastructure Team was as an assistant to the electrical engineer.

My responsibilities and tasks varied over the course of my employment, some examples were database extraction and report writing, safety interactions and structural design.

My safety awareness, technical writing, reporting and practical thinking have benefited greatly from my vacation employment. From my vacation work I learnt that the most efficient method of problem solving was to work as a team and ask lots of questions. The time spent with Rio Tinto I believe is an important step to furthering my career and I will take the skills I have learnt wherever I go.