

## Executive Summaries

### 2010-2011 Bursary Vacation Placements in Western Australia

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**STUDENT:** Pascal How Chit Mun  
Curtin University of Technology

**COMPANY:** ABB

My spell at ABB lasted for three months and took place during the summer 2010. The ABB transformer facility in Malaga was the place where I would further refine my skills as an engineer outside the boundaries of Curtin University. After a brief induction by my supervisor Mark Ellerton, I understood that I would be involved in the sales department. ABB Malaga owns the majority of distribution transformers throughout Western Australia and its sales department constantly deals with tenders from various engineering companies. While the nature of my training has been mainly technical, I was eager to learn more about that other aspect of engineering. Under the supervision of my seniors, I familiarised with transformer data sheets, specifications and letter of offers. My understanding about the entire process gradually improved and after a few weeks I started to write quotations for several customers using the software Australian Marketing System which is better known as AMS.

One of the greatest aspects of my vacation was the variety of jobs that I got to do. After about a month spent at ABB, I began to be involved in different departments. Owing to my mechatronics background, I was comfortable with both mechanical and electrical systems. This enabled me to design transformers along with the design engineers and obtain a good understanding of the basic transformer mechanisms. I was heavily involved in O'Donnell Griffins Gin Gin Raaf Project and I got the opportunity to design two of their transformers rated at 200 and 300kVA respectively. The design process was a tough challenge since a thorough knowledge of the transformer components was essential when assembling the core, tank, cover and instruments.

Occasionally, I did some work in the production field and I was given more freedom when solving issues encountered by the factory workers. These people are involved everyday with machineries and I was given the task to find alternatives to existing systems which were sometimes not practical.

These few months spent at ABB's premises were among the most enriching engineering experiences of my life. Thanks to this constant exposure to engineering challenges, I believe that my transition from a mere graduate student to a professional engineer will be easier.



**STUDENT:** Lee Ucich  
Murdoch University

**COMPANY:** Western Power

My vacation placement was set in Western Power's Service Delivery Division under the Distribution Design Engineering group. The twelve weeks were divided into two six week periods; firstly with the Responsive Design team and finishing with the Network Reinforcement Design team. The purpose of this field experience was to understand how my acquired academic engineering skills could be implemented to solve real power industry related problems. It also provided an insight into the operations of a power utility company and how professional engineering teams collaborate to deliver projects within deadlines.

The Responsive Design team provided me with an induction into WP's systems of safety, management and protocol. The first two weeks were spent learning about the workplace environment, its processes and structure and reading through relevant technical standards. I was enrolled in a number of internal training courses that developed my understanding of WP's document management system and how to analyse low voltage residential and commercial networks. Equipped with some basic knowledge, my Responsive Design 'buddy' then explained the project delivery process by providing a number of past examples for which I studied. I then shadowed him on his next project by; learning the problem, creating solutions, solving the LV network, performing a site visit, determining a cost estimate and discussing the outcome with the project manager.

The Network Reinforcement team sort to bridge my 'design skill' gaps in knowledge by tutoring me in a design drawing software application. I was given a number of side tasks to complete so the team could assess how ready I was to take on my own project. After positive feedback, I was given five automation projects to work through from project kick-off to Capital Project Approval. Experiencing the complete design process introduced me to new ways of problem solving and critical thinking. It provided me with a healthy appreciation for each team member's role and how teamwork can expand your own ability to think outside the square.

Overall, the vacation experience has increased my confidence, drive and passion for power engineering. Achieving project delivery instilled in me, a sense of pride and a feeling of team spirit with the professional teams I collaborated with. I recommend a Western Power vacation placement position to all future students whom are embarking on a career in the power engineering industry.



**STUDENT:** **Gloria Rupf**  
**Murdoch University**

**COMPANY:** Verve Energy

This report outlines the knowledge I have gained and my experiences whilst undertaking Vacation Employment at the Sustainable Development Branch of Verve Energy. The report demonstrates how these experiences have played an important role in my professional development, particularly in improving my communication, creativity, research and technical skills.

Verve Energy is the largest power generation company in Western Australia. The Sustainable Development Branch heads all of Verve Energy's renewable energy projects from feasibility studies, construction, and operation through to decommissioning.

The project I was given during my six weeks at Verve was to determine how a real-time digital display could be set up for the visitor's viewing area at Albany Wind Farm. The need to upgrade the visitor's display had arisen due to the construction of the Grasmere Wind Farm; an extension of the existing wind farm in Albany. Before I could develop ideas on the type of display that could be set up, I first had to learn the basic structure of the communications system at the wind farm and determine what outputs are available from the wind farm's SCADA system. This was followed by discussions with the electrical engineers involved in the Grasmere Wind Farm Project as well as the engineers from the wind turbine suppliers to explore the different display options. The main challenge was to determine the most ideal way of transferring wind farm output data to the display area. Through a recommendation from the wind farm suppliers I was able to contact a German renewable energy software company which specialises in wind farm visualisations. After reviewing their products and obtaining a draft quote, it was found that their software would be ideal for the digital wind farm visitor's display.

I thoroughly enjoyed my vacation work placement with the Sustainable Development branch of Verve Energy 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 learn about the basic operation of a Wind Farm and also some of the processes involved in the construction of a wind farm. I also had the opportunity to converse with a range of engineering professionals both within Verve Energy and also from a few German renewable energy companies. I feel very fortunate to have had this experience of working in the renewable energy field of power engineering which is of particular interest to me.



**STUDENT:** **Natalie Cushion**  
**UWA**

**COMPANY:** Western Power

My vacation employment was undertaken at Western Power's Jandakot depot in the Distribution Standards and Policies department in the underground section.

The major project I was involved in during my employment period was the underground cable tender. This project was to evaluate tender submissions and select the successful company for the supply of underground power cables rated at 33kV, 22kV and 415V for a period of 3 years.

A smaller project I had involvement with was the pillar protection trial. In the construction phase of new sub-development sites, Western Power's pillars are often damaged. A trial was setup in order to determine whether placing above ground bollards would reduce the amount of pillars damaged.

I was also given the opportunity to attend various training courses which have significantly aided my understanding of the need for safety both within the general workplace and in the field of engineering.



**STUDENT:** Rhys Butcher-Mullins  
UWA

**COMPANY:** Woodside Energy Ltd

My vacation work was with Woodside Energy Ltd. For the 12 week placement I was located at the Karratha Gas Plant. I was assigned to the LNG123 and Power generation and Utilities groups of the Production Division. This involved the generation and distribution side of power engineering.

The purpose of this report is to demonstrate learning that has occurred over the course of the API bursary program. It will also show knowledge and experience I have gained in the written communication of technical ideas.

A project I was involved in was to investigate whether some large motors could be started when only one out of the two transformers connected to its bus was operational. To solve this problem I had to develop an existing computer model of the plant's power system in order to simulate the motors starting. The simulation results showed that the motors would be able to start, but then I had to compare these results to a time-current co-ordination graph that involved operational limits of the motors. This comparison showed that they would not be able to start as they would trip the cold starting thermal overload when there was only one transformer operational.

Another project I worked on was a hazardous area equipment maintenance audit. This involved interviewing various personnel to assess the current maintenance strategy. The outcome of this was a report identifying various issues and recommendations to rectify them.

Overall it was a valuable learning experience. I gained knowledge of Woodside's various systems and processes and an appreciation of power engineering.



**STUDENT:** **James Shilling**  
**Curtin University**

**COMPANY:** Verve Energy

My vacation work was undertaken between November 2010 and February 2011 at Verve Energy, in the Gas Turbines & Sustainable Operations Branch in Welshpool. The Gas Turbines and Sustainable Operations branch operates and maintains the Verve open cycle gas turbine fleet, as well as the Verve wind turbine generator fleet and off-SWIS wind/diesel stations.

I was lucky enough to work on a number of small projects while at Verve. These projects included work with surge capacitors, cables, inverters, control systems, and data backup and recovery. All these small projects exposed me to engineering essentials including Australian Standards, incident reports, engineering polices and procedures, safety policies, memos, and audits.

In my time I had the privilege of being involved in a hazard and operability study (HAZOP) conducted on Stages C & D of Pinjar Power Station. The HAZOP was undertaken by GPA Engineering and involved studying the various systems within the gas turbines, determining points of weakness and potential hazards under certain circumstances. This gave me a great understanding of how the gas turbines worked from a mechanical engineering and control systems point of view, and I am definitely better off for it.

My work included site visits to the Pinjar and Kwinana Power Stations, where two new High Efficiency Gas Turbines are currently being constructed, and where the current gas turbines has just been equipped with a new state-of-the-art control system.

The experiences I have had at the Gas Turbines branch have truly been memorable and I am truly grateful towards the staff guiding and teaching me along the way. As I go into 3<sup>rd</sup> year electrical engineering I feel confident that my work experience will help me further my studies and increase my technical capabilities.



