## Executive Summaries
### 2012-2013 Bursary Vacation Placements in NSW

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This report outlines my 10 week placement in Endeavour Energy from December 10th, 2012 to February 22nd, 2013. I worked in Network Development, in the Transmission Mains Projects Section. I was based in the Glendenning office in Western Sydney.

I spent time analysing concrete electricity poles, including the protocols that are behind their design, positioning and dimensioning; creating the concrete pole ferrule drawings to be used for ordering; learning the use of the AutoCAD\(^1\) technical drawing software, Drawing Information System Software\(^2\) and the valuable PLS-CADD\(^3\) software. I gained experience into the process of acquiring external services for an intermediate design project by participating in the Replacement of Gas & Fluid Insulated Cables at Outer Harbour Project. I learned about the tendering process, high voltage design procedures and procurement and how the different organisation segments tie together to achieve units of work.

Working in Endeavour Energy has enhanced my understanding of the nature of the power engineering industry, the problems power engineers encounter and the parameters that constrain a solution.

Aside from the technical skills I have gained, I have also learnt the importance of safety in all aspects of work. I have a much better understanding of effective communication skills and effective reporting; that it consists of providing concise, relevant information that is supported by evidence where required. Also, I learnt how to select the best medium of information (qualitative, quantitative, graphical, statistical, and verbal) depending on the forum it is to be communicated on.

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\(^1\) Endeavour Energy’s technical drawing software
\(^2\) Endeavour Energy’s electronic technical drawing register
\(^3\) PLS-CADD: Power Line Systems Computer Aided Design and Drafting. Endeavour Energy’s software for modelling pole and wire assets.
During the period of my three month vacation employment, I was given the privilege of working with Ausgrid in their Network Operations division. Being positioned here, I was able to attain a unique insight into the broad structure of the network at the highest level of operations.

The position I was assigned to was a vacation employee in the System Control branch.

The purpose of this report is to provide a testimony to the essential skills and knowledge I have acquired through the API bursary program during the summer of 2012-2013.

My main task during the period was investigating the feasibility of two network modelling tools as a means of accommodating the needs put forward by the Control Room and Network Security teams. This was carried out by regularly liaising with staff ensuring that their requirements were clearly communicated and coordinated in a manner that considered both teams. Furthermore, because Study Model Power Analyser is a customizable software tool, it meant that I was also in liaison with those currently involved in its development, in particular the vendor under contract with Ausgrid. With their assistance, issues were identified and suggested solutions were gradually implemented over a period of time ultimately forming a pathway for future test scripts to enable a comparison between the two network modelling tools. Additionally, I was involved in testing an upgraded version of Ausgrid's Outage Management System through executing test scripts and identifying defects that needed to be rectified. A performance analysis on the system was also carried out on the effectiveness of model changes in the OMS.

My projects during the vacation employment have undoubtedly primed my knowledge and practical skills that will be valuable in my endeavours as an electrical engineer. My exposure to the professional environment has enhanced desirable workforce traits such as my investigative, interviewing, and reporting skills.

Being my third and last placement, I would like express my sincerest gratitude towards Ausgrid and the Australian Power Institute for being a part of their bursary program. The opportunities I have been privileged with during the summer vacation have endowed me with vast knowledge and skills that can only be attained through the work experience that the API has been a constant sponsor of. My confidence in pursuing a power engineering career has certainly been cemented and I look forward to the challenges that arise before me as an electrical engineer.
As an industrial student at TransGrid, I worked alongside fellow graduates and professional engineers to further my education and familiarisation of the NSW transmission network. Being assigned to Network Planning and Performance (NP&P), I participated in multiple load flow studies of the NSW transmission network whilst developing an understanding of the structured planning process and rigorous documentation.

During my employment I was exposed to the extensive project planning stage of identifying load-driven needs, recognising the available options to resolve these needs, creating the documentation necessary for scoping these solutions and finally approving the suitable option to initiate the project delivery stage. This interactive planning work allowed me to appreciate the challenges and necessities in the power industry.

My placement helped me develop a comprehensive understanding of network system modelling with load flow analysis, briefly touched upon during my university education. This included familiarisation with control buses, swing buses, line and equipment thermal ratings and overloading, tap monitoring, reactive support and voltage stability, N-1 contingency system operations and many other properties and scenarios regarding load flow.

The main hurdles encountered in this experience were minor and easily overcome with the assistance of my team. The software used to simulate load flow of the transmission subsystems had a steep learning curve as there were different versions on different operating systems and the syntax, command structure was not explained very well. After a while the load flow studies became more fluid and I ended up writing a guide to the desktop version. Other problems included jargon confusions such as line names and load flow mismatches with the operating manuals which I helped fix.

In summary, I absorbed an outstanding amount of knowledge about the NSW transmission network with respect to the extensive planning process and documentation. I am extremely grateful for the opportunity to expand my knowledge of the transmission network configuration and provide fulfilling contributions to the Planning teams at TransGrid. I believe Network Planning and Performance is a fascinating experience for student engineers by providing awareness to the complexity of high voltage transmission projects and its influences and interactions with the distributors.
I undertook work experience with TransGrid over the 2012-2013 summer vacation. This report details my work placement as an undergraduate electrical engineering work experience student. My position in the company was with the Network Performance team as an undergraduate industrial student. The placement was held at the Wallgrove office, Metropolitan Regional Centre. The activities carried out and events I participated during my stay are reviewed in the following report.

TransGrid is the owner and manager of the High Voltage transmission assets and is responsible for the High Voltage (HV) network connecting generators and distributors. TransGrid's network is interconnected to Queensland and Victoria.

The placement was held with the Network Performance team of the Asset Performance business unit group. The Network Performance team is responsible for ensuring the substation, secondary systems and transmission line assets are maintained and operated by developing and implementing the associated policies and strategies. The three key areas of responsibility of Network Performance are AER Market Impacts of Transmission Constraint (MITC) and Service Target Performance Incentive Schemes (STPIS), Performance Reporting and Technical Performance Assessment (TPA).

I was placed under Andrew McAlpine – Network Performance Manager. The following report discusses and details the activities I was involved with, outcomes, challenges faced, how I approached to solve these challenges and skills acquired. As this was a completely new section for me, there were many problems encountered and I faced many challenges.

During my placement I was assigned the following tasks:
- Opslog data (Irregularities)
- Security Inventory Data
- Network Management Plan

The main challenge for the Opslog data was coming up with the categories. The categories were the fundamental aspects as they provided clear and concise representation of the irregularities. In order to overcome this challenge I discussed my options with other team members in order to know the information required and based the categories on these. The challenges for the other tasks and approaches taken to tackle these are outlined throughout the report.

This placement has given me a greater insight into the field of power engineering as I have been able to better understand the electrical network, especially in understanding the methodologies adopted in maintaining and acknowledging the condition of TransGrid’s assets. This placement has also enabled me to enhance my time management, excel, access, written and communication skills.
During my three month placement with Transgrid, I was fortunate to have been assigned projects that have helped develop my professional engineering skills whilst undertaking challenging and meaningful work. I have gained valuable knowledge of the New South Wales transmission network and have further developed my understanding of asset management.

I was placed in the Substations group of Asset Performance, located at Transgrid’s Wallgrove office. My main responsibility during my placement was as a technical secretary for a committee of inquiry. This committee was developed to investigate a recent circuit breaker failure at Sydney West substation. My role as secretary involved gathering information into the cause and effect of the failure as well as assisting in the development of action items for future investigation and failure prevention. I was required to produce a draft investigation report that outlined the response to the incident, presented relevant investigation information, and suggested potential causes of failure and prevention methods.

My secondary project that I worked on in conjunction with the investigation report was a review into a policy for holding spare transformers. This policy utilized a Monte Carlo simulation written in visual basic to determine the benefits of holding a spare transformer. This program was simple and made several assumptions about the network. I was required to further develop the program and improve the overall efficiency.

The main challenge I faced was a lack of technical knowledge. As a result, I was required to read technical documentation and communicate with experts on the subject. By overcoming these issues, I have furthered my communication and research skills.

Thanks to my placement, my communication and organizational skills have improved greatly, and will aid me in my future studies and career as an engineer.

I would like to thank the Australian Power Institute and Transgrid for the opportunity to develop my skills as an engineer in an industry setting.
STUDENT: Blake Christian (USYD)

COMPANY: Endeavour Energy

For eleven weeks during the summer vacation in 2012/2013 I worked at Endeavour Energy. The section I was involved in was Network Development, Major Projects B. During my time in Major Projects B, I gathered an enormous amount of knowledge relating to project management.

My main tasks involved stage forecasting of projects managed by my section, tracking down the status of safety reports, writing sections of Post Commissioning Reviews and collating project difficulties and recommendations. I was also given a number of opportunities to go on site to projects being completed and witness project development first hand.

During this time, I gained a great insight into what is required of project managers and the type of work they do. I learnt much about how projects are monitored and I learnt a lot about how projects develop over time. I also learnt how to better write company document and my skills in Microsoft Excel also improved.

The knowledge and skills that I was able to gain from my placement at Endeavour Energy will no doubt help me in my degree in the coming year and will assist me in any electrical engineering job that I find myself in in the future. I would like to thank the Australian Power Institute and Endeavour Energy for this opportunity in the Summer Vacation Engineering Program.
This report details my experience during the course of my 2012-13 summer vocational placement with Delta Electricity - one of the largest wholesale generators of electricity in the National Electricity Market (NEM).

During my tenure I was located in the Central West of NSW working at Wallerawang and Mt Piper power stations with the Plant Performance group. Plant Performance is the section within Delta Production whose function is to collect and interpret plant data to develop, prepare, maintain, advise on, and implement plans and procedures covering enhancement, modification, installation and predictive and corrective maintenance of plant including cost benefit analysis.

My primary task with Plant Performance was to conduct an audit of Delta's black system equipment to assess the readiness of WPS and MPPS in responding to and surviving a black system condition. A report detailing the findings was produced following the investigation process.

The placement with Delta Electricity has given me a comprehensive insight into life and the inner workings at a modern power station. The work task in particular challenged me to extend and develop my analytical, technical, organizational and interpersonal skills. It allowed me to interact with a variety of station staff and exposed me to an assortment of station plant. I was also exposed to several of the of rules, standards and authorities that govern the operation of the NEM and NSW electrical grid which gave me an insight into the complex nature of managing the national power grid.

Overall the placement with Delta Electricity has exposed me directly and indirectly to a variety of facets of the generation side of the power industry. The experience has equipped me with skills and understanding to undertake further study and prospective employment in the power industry. My time at Delta Electricity has demonstrated that it is a field that offers both great challenges and rewards for those who commit to a career in the industry.
From December 2012 to February 2013 I was placed in the Transmission Outages division of network security. The main role of the group is to assess and coordinate planned outages on the network. All requested outages are analysed and in some cases modified by the group to ensure that the network will remain secure if the outage is allowed to proceed. The group is also responsible for determining the associated risk of each planned outage and in high risk cases developing a restoration plan for the losses of other pieces of equipment.

Most of the work I was involved in was centred around outages this included the main task of assessing and evaluating requests but also many other tasks such as updating loads and rating on the system diagrams, managing the outages diary and preparing weekly reports. Furthermore during my placement a blanket ban on all switching that involved the handling of asbestos containing equipment was put in place, leading to a large number of cancelled outages. I was heavily involved in the process of cancelling outages and the associated correspondence work.
This report details my vacation placement with Eraring Energy from 3rd January 2013 to 22nd February 2013. I was placed with the Maintenance Group at Eraring Power Station, Rocky Point Road, Eraring NSW 2073. The Maintenance Group is responsible for resource planning, maintenance management and forced outage management.

Whilst positioned there, the group were working on the development of a manual on maintenance management required for the Maintenance Excellence vision, as part of improving the company’s work management system. I was assigned the task of assisting in reviewing the draft manual to suit the purposes of the Eraring Power Station. This document will then be used as a basis for work management training for all levels of employees. It is aimed to improve how they manage work through improved processes and systems to support the business in the future in relation to plant reliability, performance and cost efficient while maintaining a focus on environment without forfeiting safety and the environment.

After asking for any opportunities in understanding the functions of other work groups outside the Maintenance group, an arrangement was made with the Learning and Developing group and Maintenance group. This arrangement, known as “Friday Excursions” allows me, under the permission of the Maintenance Support Team Leader, John Wethered, to visit once a week, other groups within the company. I would then investigate how their work facilitates the better running of the Eraring Power Station and the company as a whole. These investigation areas include:

- Sustainability & Continuous Improvement in Operations
- Environment
- Electrical Assets
- Chemical Engineering
- Tradespeople and their work
- Wind farms

The placement also offered me the chance to talk to experienced engineers about their work, on leadership, career development, entrepreneurship, the power industry and their advice to junior engineers such as myself.
STUDENT: Maharishi Dasgupta (UNSW)

COMPANY: Transgrid

Over the course of my three month placement at the transmission network service provider Transgrid, I have gained substantial knowledge in the operation of the NSW high voltage transmission network. My duty at Transgrid was as an industrial student for the network operations/operations technical support group which is a part of the system operations business unit.

During the course of my work with Transgrid I completed several tasks related to the system security as well as stable operation of Transgrid’s transmission network. The major tasks included a complete review and update of Transgrid's existing autumn load flow model, updating the seasonal load flow models to account for the network changes throughout NSW’s electricity network. In addition, I also updated the existing transient stability limits, with the Snowy region removed as a market entity, to determine what level of stress and contingency could cause the network to become unstable. I also reviewed the system conditions during the Broken Hill 220/22 kV bus section 1 trip on 09/01/2013 and provided input to Network Performance Group (STPIS scheme submissions to AER). I also spent some time reviewing the Darlington Point area load limit for the operation X5 trip scheme due to an improvement in the power factor of the region in recent years. Furthermore, I often used the SCADA system to perform data extractions for various requests.

My technical understanding of the ongoing operation of a transmission network has been greatly increased. This has allowed me to develop as a power engineer, and provided me with a solid foundation to enter almost any area related to the energy sector.

I would like to extend my sincerest gratitude to Transgrid and API for the opportunity of a 13 week industrial placement.
This report details the experiences that I gained during my internship with TransGrid. Between the 26th of November 2012 and the 22nd of February 2013 I was placed with the Portfolio Management Office (PMO) under the Network Planning and Performance (NP&P) business unit which operates between the Sydney West Substation Office at 200 Old Wallgrove Rd, Eastern Creek, NSW, 2175 and head office located at 201 Elizabeth Street, Sydney, NSW, 2000.

The PMO focuses on several areas within project management including project sponsorship which involves the development of a project to meet a customer or technical need, data mapping and migration for incoming management software, monthly project status reporting and project data reconciliation to determine the status of a project and administration of project data and personnel. My task as an intern was to assist in these key areas of management and to produce project lists for reporting purposes, data maintenance and integrity.

Most of my tasks involved the use of Microsoft Excel and Access to generate a list of projects for sorting and filtering the appropriate information for reporting purposes or data reconciliation. Excel formulaic functions would be used to ensure that the data was valid and if necessary to add any missing information needed by communicating with other the appropriate TransGrid Personnel.

In addition to this I have also undertaken work in project sponsorship which involves the creation of a project by engaging the appropriate team to develop documentation by further engaging technical teams to determine what the scope, budget, program of works, design concept risk and environmental issues. This would also include regular communication with the developers of the documentation to ensure that all areas of work necessary are covered.

From undertaking this internship the initial challenge became apparent from my inexperience in project management as my previous internship consisted entirely of technical work. From the beginning I was encouraged to find work within the PMO which most specifically gave me the most exposure and would set to learn from my peers not only how to complete a given task but the purpose of undertaking the work. From this I would gain knowledge in the fundamentals of project sponsorship and its supporting systems which in turn allowed me to gain a more overall view of the Power Engineering industry by having knowledge on both corporate and technical sides of the business.
I have spent the last eight months in an industrial work placement at TransGrid's Wallgrove office. During this time, my understanding and knowledge of power engineering in transmission networks increased immeasurably.

The purpose of this report is to provide an overview of my work placement and to demonstrate the learning value of my time at TransGrid. In addition to gaining a vast amount of technical knowledge during my placement, my written and verbal communication skills also improved immensely from the experience of working in the industry.

My position was a secondary systems planner in the Secondary Systems Asset Management team. My role involved producing various documents, contributing to projects with a total worth of over $170 million. Prior to beginning this placement, I had little knowledge of how secondary systems (i.e. control, protection, metering and communications) fit into a power system; however I gained an immense amount of technical knowledge from the experiences I had working on different projects. My primary methods for learning were analysing TransGrid’s technical and design drawings and discussing problems with co-workers. I also consulted some websites and textbooks for a deeper understanding of these electrical engineering concepts.

I faced many challenges during my work placement, particularly regarding the technical characteristics of the projects I was working on. I discovered methods to solve these challenges, such as by consulting planning and design documents, as well as referring to past similar projects. In doing this, I also learned that it was necessary to constantly question and investigate the information in such documents, as the current standards are always changing.

I also found that conducting site visits was an excellent way to gain a greater understanding of the projects I was working on, and I was able to utilise site visits to complement my learning and to contribute to the documents that I was preparing.

I wish to offer my sincerest appreciation to TransGrid and the Secondary Systems Asset Management team for providing me with this placement and the great opportunity to learn and develop my skills as a power engineer.
During my 2012/13 summer break, I was fortunate enough to spend three months working in the ‘Mains, Property and Environment’ (specifically Facilities) section of TransGrid at Central Region - Metropolitan Area Depot (Wallgrove), during which I acquired a wealth of knowledge and skills, further enhancing my passion for electrical engineering, in particular Power and Transmission Systems. TransGrid is the owner, operator and manager of New South Wales high voltage network, responsible for the transmission of high voltage power from the Generators to distributors. TransGrid’s network interconnects with Queensland, ACT and Victoria, to promote market benefits through competitive pricing as determined by AEMO (Australian Energy Market Operator) and enhance TransGrid’s ‘Smart Grid’ network. The network spans 12,656 kilometres consisting of overhead transmission lines, underground cables, substations and switching stations consistently delivering network reliability of more than 99.999 percent.

Having worked in such a broad sector, I was able to extend my knowledge and experience, within the work scope of each group, with most of my tasks and major project stemming from the Mains team. My major project involved in-depth research and investigation into the open market for a new Conductor Trolley used to install and repair hardware on parts of the transmission line. The project encompassed collaboration with other team members within TransGrid, employees of external companies (in Australia and internationally) as well as managing information and progress meetings, allowing me to obtain adequate information to produce an Internal Memorandum, examining the products feasibility, safety precautions and technical characteristics. Once approved, this will allow the Mains team to purchase the trolley for trial purposes (initially). I was also involved in camera monitoring systems, lights/fittings, Fire Detection maintenance and investigating the validity of certain specification sheets. In addition, I ventured to different substations and transmission lines and learnt about the different components within the switchyard, pole replacements and experienced physical works on small electrical components of the substation that allowed me to develop technical skills and better understand key theoretical concepts presented throughout my university studies.

My time at TransGrid has improved many of my skills both technical and non-technical which have better prepared me for future power subjects I will undertake at university, as well as future employment within the power industry.

I would like to thank the Australian Power Institute and TransGrid for the invaluable opportunity to play an active role within the Power industry.
I undertook my summer vacation placement at Endeavour Energy. Endeavour Energy is one of NSW’s three distribution network service providers that comprise Networks NSW, Essential Energy and Ausgrid being the remaining. Endeavour Energy’s network provides to Greater Western Sydney, Blue Mountains, the Illawarra and Southern Highlands. I worked in the Earthing and Power Quality section, which is under the Network Engineering branch.

The purpose of this report is to demonstrate that learning has taken place on vacation placement, facilitated by the API Bursary Program. I have acquired significant knowledge of the power engineering industry and developed valuable professional communication and interpersonal skills.

Power engineering is the design, manufacture and maintenance of systems that generate electricity and then transport it to industrial sites, businesses and homes for use. One of the most dominant challenges in power engineering is minimising power loss. In the distribution stage, maintenance balancing cost and benefit, safety of workers and the public, fault management, and power quality were significant challenges. My experience was valuable in opening my eyes to all the areas of power engineering. Working in the Earthing and Power Quality Section I most developed an understanding of earthing systems at substations and low voltage network power quality issues.

A problem for me was my limited knowledge of power having only completed the first year of my degree. I learnt a lot by my own research and reading, which developed these skills. The Endeavour Energy employees were always willing to answer questions and share their knowledge.
STUDENT: Penny Player (USYD)

COMPANY: Ausgrid

During the summer of 2012/2013 I was placed on work experience with Ausgrid in their Maintenance and Replacement Planning office in Pymble.

Over the 12 weeks I was given a variety of tasks including completing a Risk Condition Assessment of a zone substation, a review of the perimeter fencing standards around all transmission substations and extracting and manipulating data from SAP/Business Objects to investigate the cause of mains failures and automate an ongoing process monitor the situation.

This was an invaluable experience for me and I have gained knowledge not only of how the power industry works, but about the office environment, the managerial chain and the results of restructuring an organisation. In addition I was also able to apply and further develop personal and professional skills such as report writing, programming and time management.

I give my thanks to the API committee, partners and Ausgrid for giving me this valuable opportunity.
During the 2012/2013 summer vacation I had the privilege to work in TransGrid’s Capital Program Delivery unit as a project manager. TransGrid is responsible for the high voltage transmission of electricity throughout NSW.

The purpose of this report is to outline some of the challenges in the dynamic power industry and to convey how my experience at TransGrid has well placed me to tackle these challenges as a future engineer.

As NSW’s electricity transmission assets come to the end of their serviceable life, TransGrid is responsible for replacing and building new infrastructure to handle higher loads in a reliable and sustainable fashion. My experience with the projects group has introduced me to several projects, such as new GIS substations, 330kV cable installations and new Transformers which will form the backbone for NSW’s energy supply for years to come.

However the greatest lessons learnt were while managing my own project, where the focus was on delivering the project in a safe manner with minimal environmental impact and with quality in mind. Time and budget were also critical factors when delivering the project.

My role was to be the project manager for the Sydney North Substation Fibre Marshalling Kiosk (FMK), worth $190,000. The FMK was for Ausgrid to separate their fibre optic protection assets from TransGrid’s, and therefore eliminate any liability issues when a fault occurs. During the project management stages I was required to delegate tasks to design teams, resolve safety issues and ensure environmental controls were implemented. Strong communications skills, both written and verbal were required to ensure all stakeholders concerns were managed.

The experience of working as a project manager on a project with an external stakeholder has provided a deep insight into the challenges that can arise when two governing bodies with different standards are involved.

I would like to extend my sincerest gratitude to TransGrid for the opportunity to work as a real life engineer amongst the best in the field.
STUDENT: Matthew Delore (UoN)
COMPANY: Alliance Power and Data

Over the six week period of employment at Alliance Power and Data’s (APD) NSW office I have thoroughly improved my knowledge and understanding of the power engineering industry. In my position I was given various different tasks that were for me to further develop the skills and understanding I had, making my vacation employment an incredible learning experience. This report sums up my experience.

Before beginning my employment I undertook the White Card training program. Through this program I obtained valuable knowledge in workplace safety, preparing and allowing me to attend site visits. This training will be very valuable for future employment. The APD and SILCAR inductions I completed furthered my knowledge in workplace safety and taught valuable information for the course of action if an accident were to occur.

I worked on compiling a list of the latest applicable Coal Standards to Electrical Infrastructure, became familiar of the Line Design process from site data collection to the end design, development of a guideline check-tool for Volt Drop calculations using industry tool and looking at how earth resistivity is calculated. I also got to spend plenty of time on site in multiple sites in NSW and QLD. This gave me a clear idea of what goes into a design for a project and the preparation that is required. I learnt how to use all the site equipment and the reasons behind what it was being used for. This was a perspective on power engineering that was new to me and I found it very intriguing.

Problems arose throughout my placement, such as missing a piece of information for a design. In one case I was able to replace incorrect data by using mathematical methods to solve the problem. It shows to me the importance of being able to problem solve in a field such as engineering. Another problem was a piece of code in VBA was compiling very slowly. I identified ways in which it could be sped up which would result in a better program.

The experience I have gained from this small amount of work is completely invaluable. This vacation employment has reaffirmed my belief that I have chosen the correct career path and I would recommend the API bursary and APD to anyone interested. I’m very much looking forward to my next vacation experience to even further develop my skills and knowledge.
During my 14-week placement at Transgrid, I have significantly increased my technical understanding of the operation of the NSW transmission network.

As a part of the Central Region Substation Support group, a division of the Network Services and Operations Business Unit, I had the opportunity to assist in a number of tasks that allowed me to apply skills and understanding from university, whilst learning new skills specific to the task at hand. My main tasks included the researching and compiling of condition assessments for a number of auxiliary transformers in the central region, condition assessments of the Sydney North and Sydney South substation 415V AC auxiliary supply systems, and the condition monitoring and data analysis of all circuit breakers in the central region.

Through completion of these tasks, and numerous smaller tasks, I have developed a more comprehensive understanding of the electrical and mechanical operation of these pieces of equipment, as well as the interconnections with other equipment in the substation. Furthermore, the opportunity to make numerous site visits under the supervision of a trained Transgrid staff member has been an immensely valuable experience, affording me the occasion to ask questions and learn about the details of operations inside a substation.

My placement has provided me the environment to practice and improve my report writing, office etiquette and professional communication, and I have learnt many valuable skills such as locating, referencing and following company standards and procedures during the completion of my tasks.

I would like to pass on my sincere appreciation to Transgrid for the opportunity to undertake an industrial training placement, and to the Australia Power Institute (API) for the provision of the bursary program that is supporting Australia's future power engineers.
STUDENT:  Tracy Al Bustamante (UWS)
COMPANY:  Ausgrid

During the summer 2012-2013, I had the opportunity to work at Ausgrid Silverwater Learning Centre where I worked under Secondary Systems Support section in the relay testing lab.

My role during my short tenure as a vacation engineering student was divided into two main tasks. I was assigned to carry out analysis and investigation of a quality control database with the assistance of a senior engineer in relay evaluation to determine the mean time between failures (MTBF) of various types of relays. Also, as part of reliability procedure in the testing lab, I performed several assessment checks for a number of protective relays to ensure they’re safe and working in accordance to a T4A (test for approval) standard compliance document specific to each type of relay.

I gained an understanding and awareness on the importance of power system protection in the network, particularly protective relay system. As a result, my understanding and knowledge in the Power Industry has grown.

Over the three month period of work experience, my awareness and understanding on processes involved in reliability, test procedures and operations of protective relays has increased significantly. I gained valuable experience in testing protection and logistical management in the laboratory environment. Work on data analysis and investigation developed my critical thinking process and data manipulation on database software.

Overall, the knowledge, practical skills and valuable experience I had obtained during my vacation placement at Ausgrid under Secondary System Support section has helped me immensely develop my knowledge in Power engineering.
OVER MY THREE-MONTH EMPLOYMENT IN ENDEAVOUR ENERGY'S DESIGN OFFICES AT GLENDENNING, I FEEL I HAVE EXPANDED MY DEPTH AND UNDERSTANDING OF THE POWER UTILITY SECTOR QUITE CONSIDERABLY.

MY POSITION WAS AS AN ELECTRICAL ENGINEERING CADET, IN THE TRANSMISSION SUBSTATION DESIGN SERVICES, PERFORMING THE ROLES OF BASIC ELECTRICAL DESIGN, ELECTRICAL DRAFTING AND DRAWING MANAGEMENT.

MY MAIN TASKS, WHILST I WAS EMPLOYED WERE THE AMENDING OF SUBSTATION DRAWINGS USING THE SITE SPECIFIC MARK-UPS RECEIVED IN THE OFFICE, THE DESIGN OF MINOR SUBSTATION AUGMENTATIONS INCLUDING ALL PROCEDURES AND SUB-TASKS RELEVANT TO THE PROPER EXECUTION OF THESE TWO MAIN TASKS. THIS PROVIDED ME WITH A STEADY SUPPLY OF NEW INFORMATION, AS NO SUBSTATION IS ALIKE, WITH SOME HAVING EQUIPMENT OLDER THAN ME, THAT WAS STILL MAINTAINED PROPERLY ENOUGH TO BE FUNCTIONING PERFECTLY. PROVIDING ME WITH MORE INFORMATION WAS THE TECHNICAL LITERATURE AND PHOTOS OF EQUIPMENT THAT WERE MADE AVAILABLE TO ME TO HELP CONTEXTUALISE THE DRAWINGS.

AS A RESULT OF MY INTERNSHIP, I FEEL LIKE I AM IN A FAR STRONGER POSITION TO CONTINUE MY STUDIES WITH A KNOWLEDGE AND APPRECIATION FOR THE ENERGY SECTOR, AND MANY OF THE IMPORTANT ASPECTS OF A FUNCTIONING GRID. I AM ALSO CONFIDENT THAT I HAVE DEVELOPED AND FURTHER HONED SKILLS IN TIME MANAGEMENT, DRAFTING AND TECHNICAL UNDERSTANDING THAT WILL BE OF BENEFIT FOR MY NEXT PROFESSIONAL EMPLOYMENT OPPORTUNITY.
Endeavour Energy, one of three main power distribution organisations in New South Wales, offered me the opportunity to work as a Cadet Engineer from 17th of December till the 22nd of February in the Network Engineering branch. This report will detail my role in Endeavour Energy and the knowledge I have gained from this role.

During the three month period I was exposed to various technical fields that the modern-day power industry operates on. I was mainly involved in three sub division of the Network Engineering Branch, which included Protection, Overhead and Underground Mains and Substations. Some of the projects involved calculating fault currents, Conditional monitoring of Transformers using Dissolved Gas Analysis reports and calculating short-circuit current ratings for Cables.

Apart from working on projects I was also taken to substations where I was able to see Power Transformers and various types of switch gear. This particular experience was one that I valued most; as it was the first time I saw theory being applied practically.

Working for Endeavour Energy has not only increased my technical knowledge but has also complimented my University studies and has put me in an advantageous position for my future studies. I was also able to extend my professional network which has improved my communication skills. Overall taking up this position has allowed me to mature as a prospective Electrical Engineer.
STUDENT: Jonathan Au (UNSW)

COMPANY: Endeavour Energy

My three month employment at Endeavour Energy has widened my understanding of the power industry and each of the roles of the different power companies. As well as the distribution work that Endeavour Energy undertakes, I have also learnt about the different data management techniques and recording systems they use as well as their respective positive and negative contributions.

My placement within Endeavour Energy was within the Asset Data Section (AD) under the supervision of Alfonso Marino and Daryl Skene.

As a team member within the Asset Data section, my role was to compile a standards document of the many different systems that Endeavour Energy uses to maintain its distribution network. In what can be simply thought of as a big glossary, Project 1800 aims to standardise all the systems in the company starting with their individual symbology and their attributes and linking each one where possible. This document will aid in the future standardisation of the company in their Standard Asset Description documents as they move towards using one methodology for all their data management purposes.

Over the three months of my placement, I was continually excited and challenged by the steep learning curve as Endeavour Energy taught me much about the importance of an up to date company and the software it uses. I believe that my understanding of the workplace has grown and it will only encourage me to continue studying in the engineering industry.

I would like to extend my appreciation towards the Australian Power Institute and Endeavour Energy for this amazing opportunity as well as the team I was working with to make me feel welcomed and fostered my learning.
I wrote this report with the aim of sharing my experiences from working at Endeavour Energy with other bursary holders and API sponsors. Over the past three months working in the Network Asset Operations - Southern Region division of the Distribution branch of Endeavour Energy’s Springhill Depot, I was granted the opportunity to observe and learn how distribution network assets were organised and maintained, I was also given the opportunity to participate in the maintenance program design.

From working as Endeavour Energy, I was able to expand my knowledge of how the distribution network operates and the equipment involved. In the first three weeks I learnt the most, such as which cables on poles are the HV (11KV), LV (415V) and streetlight cables, as well as how isolations were provided, and the types of switches and fuses used on distribution asset poles. I went on to further that knowledge over the rest of my time with Endeavour by learning how services were provided to homes and business as well as how these assets were managed and maintained.

Other than learning and observing all that went on around me, my main roles were to update assets in Ellipse, design a plan for where and when the Pillar and Column inspectors were to go for each eight year cycle and which type of inspection was to be performed as well as designing a plan for the MDI reads and substation inspections for the 2012-13 financial year, to be commenced from February 2013 to the end of April 2013.

The main challenges I encountered while performing me role in the team was that some information from Ellipse didn’t correlate to the information obtained from GIS and that in some instances, information was missing from the information sheets I was to use and I had to find out where the information was. I managed to identify where the information I required was stored and my supervisor was able to then run off a report to obtain the information from the database that I would need.

From my time with Endeavour Energy I have learnt a considerable amount about the way the distribution network is run and my experiences have emphasised the importance of not relying on one source of information alone.