

Executive Summaries

2010-2011 Bursary Vacation Placements in Tasmania

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STUDENT: Sonia Lawrie (UTas)
COMPANY: Transend Networks



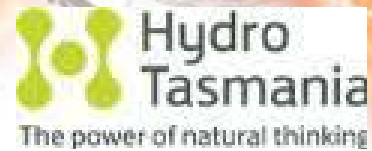
I worked as a vacation student at Transend Networks over a period of 12 weeks between November 2010 and February 2011. Transend Networks is the transmission network services provider in Tasmania. I worked within the substations team who are responsible for operating, monitoring and maintaining the substation assets and providing expertise to other departments within Transend.

The main task I worked on was an investigation into the leakage of an insulating gas called sulphur hexafluoride (SF₆). This gas is used as the preferential electrical insulator in assets such as circuit breakers and instrument transformers. As part of this investigation I liaised with a number of people from various backgrounds to compile a history of all the leaks that have occurred. I then wrote a report on the current situation, why the leaks were occurring and remedial actions to reduce the number of leaks. I then gave a presentation on the findings of the report and advise them on the remedial course of action. These actions are now being completed.

The difficulty in this investigation lay in the fact there wasn't a large percentage of equipment that had leaked. Finding common causes was difficult and a number of remedial options were not viable. I learnt about various insulators, methods employed to monitor the gas and how to find a leak. I also learnt how the power industry affects climate change, as SF₆ is a greenhouse gas and thus the leakage of it must be controlled. I also encountered the challenges of working with people with different priorities (environment vs. performance).

Another task I completed involved compiling information from thermographic surveys to aid a decision on whether to perform the surveys annually or biannually. I also compiled maintenance history for various categories of electrical equipment. From this work I learnt about the challenges and decisions made in maintaining equipment. During my employment I also attended a circuit breaker maintenance and a transformer inspection at Wilson Transformer Factory where I was fortunate enough to have a tour of the factory.

This vacation work has been both an enjoyable and educational experience in the power industry. I would like to thank the whole substations team who shared their expertise. I would also like to thank the API and Professor Michael Negnevitsky, the API coordinator at UTAS, for their continued support.



STUDENT: Osama Ali (UTas)
COMPANY: Hydro Tasmania

My name is Osama Ali. I am a fourth year engineering student at the University of Tasmania and was a recipient of the Australian Power Institute Bursary in 2008. I worked as a vacation student at Hydro Tasmania over the period starting 15th November 2010 to 11th February 2011. Hydro Tasmania is Australia's largest renewable energy business and water resource manager generating hydro power in Tasmania and trading electricity and energy related products in the Australian Energy Market (managed by AEMO). I was based in Hobart as part of Hydro Tasmania's Generation group which is responsible for the efficient running of its 27 power stations.

My work experience focused predominantly on power station turbine runners and runner shafts and included a variety of work including; ensuring safe and successful maintenance work, drafting CAD drawings of modifications to turbine shafts and station penstocks as well as carrying out on-site equipment inspections. I have also been able to further useful skills such as effective communication, time management, work prioritization and problem solving.

Working at Hydro Tasmania has also been a fantastic learning experience with regards to the Australian energy market and Australia's energy reliance on black and brown coal, although gas generation is forecasted to become an area of increasing investment. It was interesting to learn about the increasing competitiveness of wind power and research being conducted into solar and tidal/wave power resources.

Hydro Tasmania has given me the opportunity to work on an honours project looking at the optimisation of renewable energy delivery to the power grid (via the use of Diesel-based dynamic uninterruptible power systems). The project looks at a test case model power system on King Island in North West Tasmania and the objective is to achieve a 100% wind powered system, minimising the use of a Diesel system for backup.

Having arrived in Australia 3 years ago as an international student from Bangladesh, the Australian Power Institute bursary has been a huge help in introducing me to employers and the power industry. It has left me with a passion to achieve something meaningful and beneficial to society.

I would like to thank the Australian Power Institute not only for the financial help but also for its focus on the power industry. Furthermore, I would like to thank Professor Michael Negnevitsky from the University of Tasmania for his role in organizing and coordinating the Tasmania bursary program for the API.

STUDENT: Robert Stevenson (Utas)
COMPANY: Sinclair Knight Merz

I worked for Sinclair Knight Merz (SKM) in Hobart, under the company's Renewable Energy Practice Group Leader, David Pollington, alongside a team based in Hobart, Launceston, Sydney and Melbourne. SKM is a multinational and multidisciplinary consulting engineering company employing over 6500 people with offices in Australia, Asia, Africa, the UK, Continental Europe and the Americas. It was founded in Australia and is privately owned by shareholding employees.

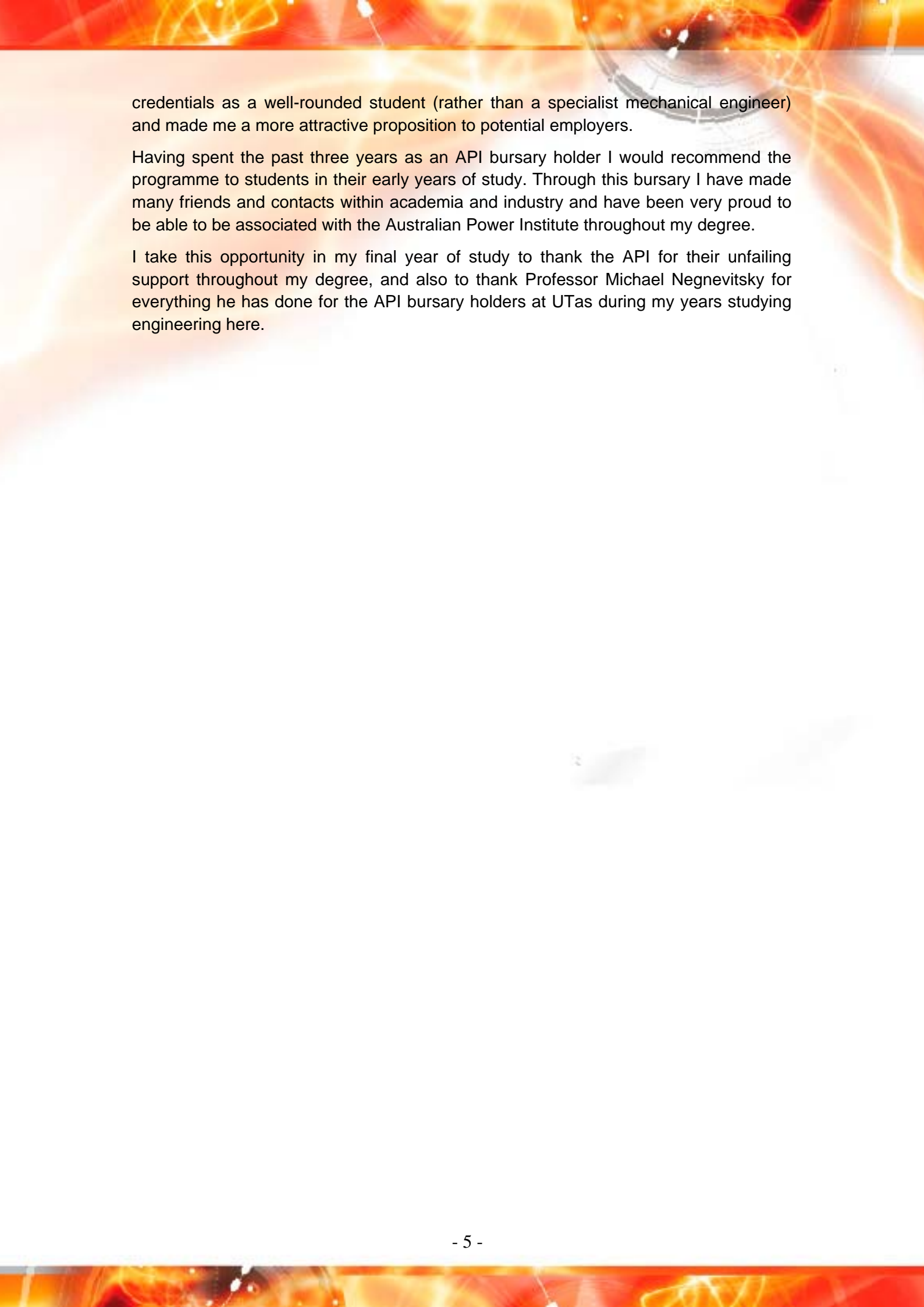
The bulk of my time was spent on tasks relating to one of Australia's largest wind farm developments, currently under construction in Victoria. For this project I worked on diverse tasks including:

- Analysing drawings and documents submitted by the wind farm contractor and critiquing these against contractual obligations and standards.
- Analysing document flow and designing an automated reporting tool for document management.
- Writing and editing documents sent to clients (proposals for new work or reports on current work)
- Writing and editing internal SKM documents which described the team's processes and risk mitigation methods put in place by the project manager and his team would ensure a well-managed project.

My work with SKM was quite varied and I also spent considerable time on various technical and other projects, including:

- A research project collating and presenting data on the state of renewable energy projects throughout Australia, data which can be utilised to better understand the renewable energy sector and assist consultants to provide engineering, scientific and economic advice to business and governments in Australia and globally.
- I created a tool to analyse and test the adequacy of cables connecting wind turbines to the electricity grid, first digitising published cable performance data from a major cable manufacturer.
- Assisting power and electrical engineers in their analysis and review of the planned development of a large wind farm in New Zealand.
- Critiquing and editing preliminary planning documents for a wind farm development in Kenya.
- A project analysing wind turbines against Australian Standards on behalf of a manufacturer wishing to sell turbines in Australia.
- Data analysis for a project SKM was contracted to perform for an electricity retailer studying patterns of electricity outages

My experience with SKM was entirely positive. The company presents a world of opportunity to graduate engineers. Even as a student I was provided challenging, varied and interesting work and completely supported when I felt out of my depth. As a mechanical engineering student I have been very fortunate to be able to work across mechanical, electrical and power fields. I believe that my API bursary has bolstered my



credentials as a well-rounded student (rather than a specialist mechanical engineer) and made me a more attractive proposition to potential employers.

Having spent the past three years as an API bursary holder I would recommend the programme to students in their early years of study. Through this bursary I have made many friends and contacts within academia and industry and have been very proud to be able to be associated with the Australian Power Institute throughout my degree.

I take this opportunity in my final year of study to thank the API for their unfailing support throughout my degree, and also to thank Professor Michael Negnevitsky for everything he has done for the API bursary holders at UTas during my years studying engineering here.

STUDENT: Samantha Connelly (UTas)
COMPANY: Transend Networks



I was a vacation student at Transend over the 2011 summer and I was placed in Network Operations which maintained the daily operations of the transmission network in Tasmania. My first task was to read "Overview of the NEM" which was such an exciting read.

My first little data project involved getting familiar OpenView and eDNA Trend and so my task was to go through TNM-SF-810-0327 Tasmanian Underfrequency Load Shedding (UFLS)_D09-37894_Ver4.xlsx document and get data from a 2 year period from a certain amount of feeders and summarize the data to get maximum Load and the time it occurred, the minimum load and the time it occurred, average load of these feeders and the average load as a percentage of the total average substation load. I also summarised the data into an average daily load profile graph for each selection of feeders. I then added a column in the original document called Average Load from Data (MW) and filled in the corresponding data.

I then tried to kill everyone in Network Operations with my death by chocolate cake. Mwuhahaha. Unfortunately no one died in the eating of the cake.

My next task was to go through and figure out the formula for some SCADA points another department was using for data. This involved sifting through the CALCS code and trying to find out which points were summed into other points, for example what points are summed together to get South Load MW calc. I was then asked to collect some more data of some substations before a certain date. This was a low priority task which involved using eDNA Trend again.

I was asked to help set up Neo 4.4 but due to my restricted access I was not able to achieve the task, however I did learn how to use the software. One other task I didn't complete was to add some functionality to an internal website. I started the task by teaching myself HTML and JavaScript but I ran out of time to implement the added functionality.

My next task involved getting familiar with SQL and making a list of Circuit Breakers, Isolators and Earth Switches. I then tried to find points which didn't seem to meet a standard naming description. I then tried to find a list of Aurora Feeders and also tried to find any that didn't meet a naming standard.

My final project involved writing some code in c# to sort through all the status and analogue points to see if the points passed a certain standard and to suggest any fixes I thought was appropriate. The results of my code were placed in an excel file. Initially the task was to try and create a template for certain points and to see if all points of that type met the template but as I don't have that much knowledge of all the points I ended up just making a description of each point, a suggestion for any fixes I could spot and those descriptions may be later used to create a template which could be used to standardize the naming process of SCADA points.

Overall I enjoyed my experience at Transend, meeting new people, learning about Transend, improving my Barista skills and IT skills.

STUDENT: Sebastian Cook (UTas)
COMPANY: Transend Networks



My name is Sebastian Cook; I am an Australian Power Institute Bursary recipient. From December 2010 to February 2011, after the completion of my second year at the University of Tasmania, I spent twelve weeks at Transend Networks where I worked in the Protection and Control team in the Engineering and Asset Services group.

I am grateful for another opportunity to work in the industry and to learn about the protection and control of an electrical transmission network. During my twelve weeks of placement I was given the opportunity to visit some transmission substations where various works were being carried out.

Transend Networks, owned by the Tasmanian Government, is Tasmania's electrical transmitter. Transend delivers energy from generating plants to a number of large industrial plants in Tasmania and also to the state's electrical distribution network. Recently Transend acquired a statewide communication network previously owned by Hydro Tasmania.

During my time at Transend I was in the Protection and Control team. The team is responsible for the control systems used to operate the network and the protection of network assets during electrical fault conditions. My work centralised on ensuring the recorded settings for protection devices were coherent with the information known about the device. This included looking up a scanned copy of the device's setting sheet and comparing the information with that in the asset database and determining whether any differences were significant. Additionally, I observed factory acceptance testing - injecting test currents into the device while monitoring the relay outputs - of new protection relays to be installed in the new Mornington substation.

I would like to thank my supervisor, Transend Networks and the Australian Power Institute for the opportunity to experience work in the industry.