

## Strengthening Global Agreements



*From left: Federico Monsada (Philippine Technological Council President), Dr Che-Ho Wei (Institute of Engineering Education Taiwan Accreditation Council Chair) and Dr Yeong-Bin Yang (Institute of Engineering Education Taiwan President).*

There were some positive developments for the New Zealand engineering profession at the annual meeting of the International Engineering Alliance (IEA). The alliance, which governs six mutual agreements recognising engineering qualifications and professional competence between nations, met in Taipei in June and IPENZ was there representing New Zealand engineers.

The New Zealand contingent's contribution was recognised with not only the re-election of **Basil Wakelin DistFIPENZ** as Chair of the Engineers Mobility Forum, one of the two largest mutual agreements, but also his elevation to the Chair of the alliance's governing group. Mr Wakelin will be the face of the alliance for the next two years and IPENZ congratulates him.

IPENZ was commended at the summit for the quality of secretariat services it provides for the alliance, and its current four-year contract to provide this service was extended by a

further two years. The Institution's contract rate – which is paid to cover costs – was increased to account for growing workload and expenses. The alliance's decision to renew the contract is a credit to secretariat staff **Margaret Dawson** and **Rachel Kenny**.

There were two significant outcomes from the meeting itself. Firstly, a revised exemplar graduate profile of the Washington Accord was acknowledged by the signatories as being of a high standard, and they resolved to work towards adopting the revised profile. To make this happen, they will need to evaluate the gap between the current accreditation standard in their jurisdiction and that of the exemplar.

The signatories agreed to have in place by June 2013 a plan to shift the accreditation standard in line with the new exemplar, with the transition complete by 2019. Consequently, it is likely a number of signatories will increase the time it takes to complete an engineering degree in their jurisdiction.

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# President's Message

Earlier this year I wrote of the range of engineering issues arising from the Canterbury earthquakes and explained these matters were discussed at the April Board meeting, which looked at how IPENZ can best serve its Members and Christchurch residents in what will be a long term rebuild of the city encompassing almost every aspect of our profession.

In response to these challenges, the Board agreed to form a strategic leadership group comprising a small, select group of professionals who would manage and oversee the issues affecting IPENZ and provide guidance on what responses were required and how best they could be effective.

The group has been active for nearly three months and it is timely to report back to Members on the key outcomes to date.

Firstly, a meeting has been held with the Royal Commission of Inquiry into building failures caused by the Canterbury earthquakes. Arising from this meeting, IPENZ has been asked to prepare a report for the Royal Commission on:

- The sequential development of Standards for building construction in New Zealand from 1935 to the present day, and the processes by which the developments have occurred
- The legislation and other rules governing the engineering profession (including those imposed by the profession itself) since 1924 to the present day, including comparisons to other countries
- How building controls are managed by building consent authorities and ways this might be improved
- Any other matters IPENZ considers may logically arise from the above.

IPENZ is working to complete this report by the end of July, and may also make its own submission to the Royal Commission.

Secondly, communications have received special attention. Following the success of the fact sheets, IPENZ has identified the need to formulate a plan for communicating technical issues to the engineering community and general public. This also follows an approach by the New Zealand Society for Earthquake Engineering, the New Zealand Geographical Society and the Structural Engineering Society New Zealand to assist them with communications issues.

A communications plan has been developed which has been informed by advice from an international risk communication expert, a Christchurch-based communications academic and a Wellington-based consultancy specialising in communication advice. This plan will be stress-tested within IPENZ and other key technical groups before being deployed.

Thirdly, work is ongoing in the field of emergency management. A meeting has been held with the Director of Civil Defence and Emergency Management and it was agreed IPENZ should be involved in a review of emergency preparedness, although timescales for this are not yet set.

There has also been progress in post earthquake building safety evaluation procedures, and workshops with representatives from the American Technology Council and the California Emergency Management Agency have been held (both organisations provided the original basis of the existing New Zealand evaluation procedures).

However, current Christchurch procedures go well beyond the existing New Zealand Standards and hence there is an opportunity to learn from the experiences in Christchurch and use these to improve and update the Standards for the benefit of other territorial authorities.

Lastly, the area of insurance and the progress of claims have received much media coverage. IPENZ has been involved in workshops designed to improve understanding around specific earthquake insurance matters and has been working on this with the New Zealand Institute of Chartered Accountants and the New Zealand Law Society. This work is ongoing and further inputs are now required from insurance companies, but it is undoubtedly a subject critical to releasing the flow of funds required to accelerate the rebuild.

This is very much an interim progress report to Members. As previously indicated, the scale of work and challenges arising from the rebuild are simply vast. IPENZ must focus its resources carefully so as to provide the best contribution it can with the best possible timing. One challenge has been to understand how the project machinery is organised in Christchurch, and that alone has not been easy. It is a very complex and dynamic situation with many moving parts, and it is important IPENZ connects to the right organisations at the right level if its efforts are to make a difference to the profession and Christchurch residents.

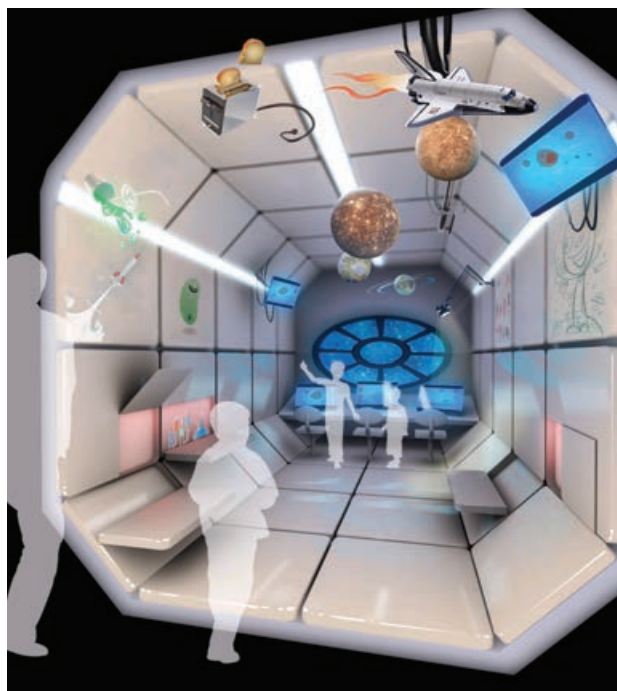
Much more work is required and we will update Members as further progress is achieved. In particular, the *Building Code* and associated Standards are coming under scrutiny, and this is a subject IPENZ must be involved with and contribute to.

I am very grateful for the input of the volunteers on our strategic leadership group, dubbed the "Canterbury Earthquake Leadership team". I would like to thank **Kevin Thompson DistFIPENZ**, **Clive Tilby FIPENZ**, **Sue Wells** and **Steve Abley FIPENZ** for giving their time so generously.

**Stephen Reindler**

# Our Stories in Space

A new gallery opening at Carter Observatory was inspired by the story of rocket scientist and Honorary Fellow of IPENZ, **Sir William Pickering**.



The new gallery, which will feature educational resources and interactive displays about rocketry and space flight, is set to open in September.

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The Institution is in good shape to implement the necessary changes, thanks to the National Engineering Education Plan. In July IPENZ began working with the Council of Engineering Deans, the Tertiary Education Commission and the Ministry of Education to develop the New Zealand plan. Lengthening the current four-year Bachelor of Engineering (Honours) degree is a possible move, but it is too early to provide further information.

The summit's second major outcome was the strengthening of the governance arrangements, a noteworthy accomplishment given the alliance began as a single agreement between six nations and has grown to six agreements involving 20 nations, many of which do not have English as a first language.

Over four years IPENZ has led, through Mr Wakelin and Chief Executive **Dr Andrew Cleland FIPENZ**, the development of coherent governance documents, one governing the three education accords and the other mobility agreements.

These new documents provide a better basis for the alliance to promote itself and expand its reach and impact globally. In turn, this will help New Zealand engineers working overseas.

Membership of the agreements was also extended:

- Turkey was admitted as a signatory of the Washington Accord (bringing to 14 the number of signatories)

Exhibits at the new Pickering Gallery will include the Apollo landings from a New Zealand perspective, the launch of Atea-1 – New Zealand's first home-grown space rocket – and the work of Kiwi engineers working on spacecraft engineering projects.

**Dr Sarah Rusholme**, Director of Carter Observatory in Wellington, says the gallery is intended to showcase the impact space makes on our everyday lives plus the important role New Zealanders play in space engineering. It is hoped the gallery will inspire children to learn about space and space engineering. The gallery, opening this September, is funded with a grant from the New Zealand Lotteries Board.

Wellington-born Sir William directed the United States Jet Propulsion Laboratory (JPL) from 1954 to 1976. As the Director he was instrumental in developing the technology for America's space programme, which included unmanned journeys to the Moon and exploration flights to other planets. After leaving the JPL he was the director of an energy company in the United States. Sir William, the only New Zealander to appear twice on the cover of *Time* magazine, died in 2004.

Carter is still looking for New Zealanders working on spacecraft engineering, or on projects that use satellite communications data, to include in the gallery. If you are able to assist please contact Dr Rusholme at [sarah.rusholme@wmt.org.nz](mailto:sarah.rusholme@wmt.org.nz)

- Bangladesh gained provisional status in the Washington Accord (keeping those holding provisional status at six)
- Australia gained provisional status in the Dublin Accord (the same status New Zealand currently holds)
- Pakistan gained provisional status in the Engineers Mobility Forum.

These changes reflect increasing global participation and commitment to helping engineers transport their skills internationally. The increased involvement of Europe in the alliance is particularly important strategically.

Along with attending the formal meetings, the IPENZ representatives also met with the delegations of countries from which many engineers travel to New Zealand and they explained the proposed changes to our competence assessment system.

The exemplary work of the Taiwanese hosts ensured the meetings ran successfully. The international engineering community learnt a great deal about Taiwan's history and culture. Clearly, a nation of 23 million people in which 45,000 engineers graduate annually has a sizeable commitment to engineering education, almost 10 times that of New Zealand's. As Taiwan's Vice President noted, his nation's commitment to engineering excellence is a basis for economic development. //

# Hello? There's been a Complaint ...

As Manager of Investigations and Discipline, I have the unenviable task of phoning up Members to inform them IPENZ is to commence an investigation into their professional conduct. If making the phone call is unenviable, I can only imagine what receiving one is like.

So, what should you do if the phone call comes?

First of all, it is important not to panic, but it is important to take it seriously. While a disciplinary order can potentially damage your career, not all complaints that reach a Disciplinary Hearing will end badly.

When a complaint arrives at my desk, I must first determine if IPENZ has any jurisdiction over the matter (not all practitioners are IPENZ Members or are chartered, in which case IPENZ has no authority to proceed) and whether the case can go ahead. Reasons for dismissal include:

- There is no applicable ground to discipline
- The subject matter of the complaint is trivial, or the alleged misconduct is insufficiently grave to warrant further investigation
- The complaint is frivolous or vexatious or is not made in good faith
- The person alleged to be aggrieved no longer wishes action to be taken or continued
- The complainant does not have

sufficient personal interest in the subject matter of the complaint

- Investigating the complaint is no longer practicable or desirable given the time elapsed since the matter of the complaint.

Assuming there is no reason to dismiss, the case is referred to the Investigating Committee, which must decide to either dismiss or not dismiss. A Fellow is chosen from the chairs of investigating committees appointed at the start of each year to act as adjudicator and make a decision on jurisdiction.

Where the adjudicator is unable to dismiss, a three-person Investigating Committee is appointed by the governing Board and headed by a new chair, supported by two Fellows with expertise in the field of engineering practised by the respondent.

The new committee will investigate the complaint. Occasionally, it conducts site visits or interviews the complainant or respondent. If no interviews take place at this stage, this simply indicates the committee is satisfied it has enough information. If the case is determined to proceed, the respondent will have ample opportunity to speak at the Disciplinary Hearing.

You are advised to be full and frank with the committee. While answering questions fully and clearly can sometimes justify the facts of

the complaint, doing so is likely to considerably reduce your penalties. Fines are limited to \$5,000 under CPEng and \$1,800 under the IPENZ regime. However, the contribution to expenses under CPEng can often be considerable. The highest contribution to expenses allowable under the IPENZ regime is \$3,600 but the highest contribution to expenses so far under the CPEng regime is \$11,000 despite being less than 10 per cent of actual costs. I believe the contribution towards expenses will rise as the profession becomes less tolerant of supporting costs for blatant incompetence or negligence. Legal precedents for contributions to expenses are commonly between one and two thirds of actual costs.

If you are an IPENZ Member you can take advantage of free advice from an Ethics Advisor. However, as the case proceeds I would advise you employ a solicitor – while this may be costly it can reduce the risk of a poor outcome.

Do not despair if a case against you goes to a Disciplinary Hearing, as often this is the only opportunity available for a judgement to be made. Investigating committees are not permitted under the legislation to determine degree of guilt. If it is unable to dismiss for the reasons indicated earlier, the case goes to a Disciplinary Hearing.

In recent years, the number of “phone calls” – as it were – has been increasing, for reasons that are unclear. Maybe tight time constraints are leading to more mistakes, or as the Chartered Professional Engineers Act becomes more recognised people are more aware of their rights. Perhaps society is just becoming increasingly litigious.

Whatever the reason, the governing Board has recognised the trend and has placed more resources into this space. From what I have observed in my role, further guidance is required for those who receive that phone call.

**Charles Willmot**

Manager – Investigations and Discipline



# Recovery and Renewal in the Pacific

Challenges remain but progress is being made, reports Engineers Without Borders representative **James Russell GIPENZ**.



*The recently reopened Seabreeze Resort in the tsunami-affected region of Samoa. As one of the few local employers in the region, resorts such as these play a key role in the recovery of the economy.*

On a cold and blustery Whenuapai morning, a ragtag group of civil servants, MPs, local government officials, NGO workers and trade representatives boarded a Royal New Zealand Air Force Boeing 757. We were there at the invitation of the **Hon. Murray McCully**, the Minister for Foreign Affairs, to accompany him on his Pacific Mission to Tonga, Samoa, the Cook Islands and Niue. I attended as a representative of Engineers Without Borders (EWB) to scope for future projects and meet with other people conducting development work in the Pacific.

We landed in Tonga to a balmy 25 degrees and suit jackets were rapidly discarded in favour of Hawaiian shirts. Tonga is a nation undergoing landmark change. With a shifting political landscape it has significant challenges to face. However, there are exciting prospects, particularly in the field of renewable energies. In a joint initiative with NZAID, Meridian Energy and Tonga Power, a one-megawatt solar power plant (the second largest in Oceania) will be installed. This focus on solar energy has the potential to benefit the development sector as skilled technicians will be needed to service the larger installations.

I last visited Samoa in April 2010 as a member of a research team looking into the reconstruction of the tsunami-affected area. I was eager to see the changes since that time and clearly challenges remain. This is most acute for water and sanitation, as secure drinking water supplies are yet to be established in some of the relocated villages.

However, significant reconstruction has taken place and several beautiful resorts have been re-established. These

resorts play a vital role in rebuilding the local economy as they are one of the few employers in the region.

Renewable energies are a significant industry in the Cook Islands, and like other parts of the Pacific there is a focus on solar power. The Cook Islands Government has set a target of 100 per cent renewable power supply by 2020. This is ambitious – it will require a commitment to tackle the challenges of climate change, and it needs our support. Water and sanitation also represent a significant challenge in the Cooks, exemplified by the pollution of the once pristine Muri lagoon with effluent from domestic, agricultural and commercial sources.

Niue is a remarkable place. Sheer cliffs fall into an azure ocean teeming with aquatic life and the occasional migratory whale. This natural beauty remains pristine, mainly because Niue has a tiny population. It has dwindled from a peak of 5,200 people in 1966 to just 1,300 today, largely due to emigration to New Zealand brought on by lack of employment opportunities. With such a small population, opportunities for development projects in Niue are limited (Niue receives significant financial support from New Zealand).

My thanks go to Mr McCully for inviting EWB to participate, the RNZAF for transporting us around the Pacific, and EWB which, fortunately for me, held its annual conference concurrently with the mission – hence my selection as the only member able to attend. Most importantly, I am grateful to my employers at Tonkin & Taylor for giving me not only leave at short notice but also the financial assistance to make the trip happen. //

# Futureintech Update

Engaging graduates in the community helps the public understand the value of technology and engineering in daily life, and is essential to recruiting and retaining a new generation of engineers.

**Chris Maguire GIPENZ**, a water resources engineer and project manager at MWH, is demonstrating the real-world applications of engineering to school students.

Originally from Ireland, Mr Maguire coordinates the Waikato Engenerate chapter and the Asia Pacific sector of the MWH Global Young Professionals Group. As part of MWH's outreach programme, he delivers presentations on sustainability to Waikato students.

Working with Goodward School on its Transpower Neighbourhood Engineers project, he helped the students investigate ways of heating the school's swimming pool. "They had some great suggestions – solar water heaters, painting the pool black. These are six-year old children and already they know so much."

Mr Maguire says community engagement produces young engineers who are driven to achieve. "It's quite

simple: engaged engineers are good for business. Supporting your graduates' community engagement builds loyalty, and they'll recommend you to other bright young engineers. So you start to build the best." Outreach activities are also a low-cost way for graduates to practise skills that can be applied to their work. "Try explaining to a determined six year old that her idea for heating the school pool with chunks of lava won't work. You'll find that needs some solid negotiating skills."

New Zealand has a deficit of graduates in engineering, science and technology and cannot rely on imported engineers like Mr Maguire to replace an ageing profession. To develop a capable and diverse engineering community for the future, young New Zealanders need to aspire to and achieve relevant tertiary qualifications.

Futureintech takes graduate engineers, scientists and technologists into primary

and secondary schools to promote their careers, helping make maths, science and technology more fun and relevant. Statistics show that since Futureintech started in 2003, New Zealand has performed better than Australia has in achieving tertiary enrolments in engineering, science and information technology.

The participation of graduate engineers in outreach programmes has many benefits for the profession: it aids professional development, heightens public awareness of the role of engineers in building vital infrastructure, and promotes engineering as a career option. Mr Maguire says it makes sense to have a workforce that knows how to talk to people outside their specialty. "In the aftermath of natural disasters such as the Christchurch earthquakes, it is especially important to have a large pool of engineers who can talk to the public and find out what they really need." //



Chris Maguire (front left) with students from Goodward School in Cambridge. He has been talking to the students about his job as a water resources engineer, and in particular, water conservation and sustainability.

# Robert Offer 1926–2011



IPENZ sadly reports the passing of **Robert Ernest Offer**, who died on 17 June 2011.

Bob, as he was known to work colleagues and friends, graduated as an electrical engineer, although a civil component was included in the degree. He started his working life at New Zealand Railways. Two years later he joined the power division of the Ministry of Works, working on hydroelectric power development schemes throughout the country until retiring in 1987. His career move resulted in switching from electrical to civil engineering, a change he readily made and reinforced by completing a postgraduate course in soil mechanics at Imperial College in London.

Bob spent his first two years as an assistant engineer at the hydraulic laboratories in Gracefield, Lower Hutt, working on the design of the Lake Tekapo control structure and Roxburgh spillway. He later transferred to Kawerau and then Mangakino in 1953, working on the construction of the Whakamaru and Atiamuri dams.

He returned to the ministry's Power Design office in Wellington in 1956.

In the early 1960s Bob was transferred to Otematata as the Project Inspection Engineer for the construction of the Aviemore Dam on the Waitaki River. In this role Bob was responsible for investigating the sources for the winning of construction materials, the development of concrete mixes, and the selection of materials for constructing the embankment dam. He was also responsible for quality control.

In 1969 Bob was transferred back to Wellington where he became the Chief Inspection Engineer responsible for quality control during the construction of the Tongariro Power Scheme, the Upper Waitaki Power Scheme, and New Plymouth Power Station. During the Upper Waitaki project Bob was instrumental in developing earthworks and concrete specifications and increasing inspection resources. Later improvements in design and construction along the Pukaki and Ohau canals were a direct result of Bob's initiatives during the construction of the Tekapo Canal.

In the early 1980s Bob was appointed the project leader managing the investigation of new hydroelectric opportunities on the Clutha and Mohaka rivers. His work on the Clutha deserves special mention – many of the issues he identified in the lower Clutha are relevant to the present day and should be included in any future investigation into hydroelectric development on that river.

Bob was a valuable mentor to a number of younger engineers. His breadth of experience, and in particular his understanding of the characteristics of potential embankment and concrete aggregate materials in the Waitaki and Clutha catchments, proved highly beneficial during later investigations into hydroelectric development on the two rivers.

Bob's passion for hydroelectric development and especially dam engineering remained into his retirement. He provided consultancy support to a number of engineering companies working on existing and future hydroelectric schemes on the Waitaki and Clutha rivers.

Bob spent time researching the early history of dam construction in New Zealand. In 1997 his research culminated in the publication of *Walls for Water – Pioneer Dam Building in New Zealand*. The book is a valuable record of engineering heritage. Bob was also a major contributor to the IPENZ National Heritage Committee and he researched and prepared a number of items for the Institution's heritage website.

Bob was a consummate public servant, always concerned about the need for high design and construction standards and the welfare of those affected by hydroelectric development. His career path reflects the historical era of centralised power planning from the 1950s to the 1980s, during which time engineers designed and constructed many infrastructure assets that have served New Zealand extremely well to this day.

(Courtesy of Tony Pickford)

## PROFESSIONAL DEVELOPMENT EVENTS

### Wednesday Webinar Series – Excel

This is a four-part webinar series broken into the following main topic areas:

- “Efficient Spreadsheets”, Part 1 and Part 2, will allow you to produce cleaner, more efficient spreadsheets. There will be a lot of valuable tips and tricks suitable for all levels of user except basic beginners
- “Making More of Excel”, Part 1 and Part 2, will show you techniques such as how to: import data from other systems; create formulae, and how and why to apply them; create pivot tables, allowing you to learn the remarkable power and flexibility of this incredible analysis tool; and create powerful and dynamic summaries of large amounts of raw data and how to chart these and find solutions to many common pitfalls.

### Earthquake Engineering

The aim of this course is to provide an introduction to the basics of earthquake engineering in New Zealand. Where appropriate, reference to NZS1170.5 will be made. It will familiarise participants with the steps involved in seismic design and the concepts leading to these steps.

It is envisaged this course will be an essential primer for professional engineers new to earthquake engineering and will also be useful as a refresher for professional engineers who have had basic earthquake engineering training in the past.

For further information on dates, locations and how to register please visit the engineering calendar at [www.ipenz.org.nz](http://www.ipenz.org.nz) or contact [cpd@ipenz.org.nz](mailto:cpd@ipenz.org.nz)

## ENGENERATE UPDATE

### Wind, electricity and earthquakes

Engenerate Auckland and Waikato teamed up with IEEE GOLD to organise a visit to the Te Uku Wind Farm on the Wharaurua Peninsula near Raglan in June. This world-class wind farm is New Zealand’s newest, with 28 2.5 megawatt (MW) Siemens turbines – the tallest in New Zealand. It has a generation capacity of 64.4MW (enough to supply power to 30,000 homes). A highlight of the trip was the sheer scale – and sound – of the wind turbines up close.

Also in June, members of Engenerate Canterbury, in conjunction with the IPENZ Canterbury Branch, were treated to a presentation on the earthquake response of Connetics Limited, a Christchurch-based infrastructure power and lighting company. Attendees were welcomed bright and early on a cold Canterbury morning with a cooked breakfast. **Jono Brent**, Connetics Chief Executive, entertained the group with details of the great work his company has been involved in since the September and February earthquakes. Interest in the talk exceeded the organisers’ expectations, and Mr Brent did a fantastic job explaining the critical issues.

A six-week CPEng night school was held throughout May and June in Auckland. The school was run by IPENZ assessor **Rob Lund FIPENZ** with the assistance of a rotating crew of



Image courtesy of Samantha Boone

recently-qualified professionals. The initial session took participants through the requirements to launch a CPEng application. Attendees were provided with valuable tips on how to begin work on their applications and what the assessors were looking for. At workshop sessions participants received feedback on their progress. In the final session Mr Lund explained what applicants could expect from the interactive assessments and how best to work this to their advantage.

With the success of the pilot night school, the trial was extended to Wellington. Interest in the night school is now being gauged in other parts of the country. //



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