

HVAC&R

Nation

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**Skills
WORKSHOP**

Developing a
gas measurement
and monitoring
plan – Part 2

FEATURE

Ammonia
glycol chiller



PACIFIC PERSPECTIVE

**THE AUSSIE HVAC&R TRAINER SCHOOLING
THE PACIFIC ISLANDS' FUTURE TECHS**

PACIFIC PERSPECTIVE



Michael Moller (back) training and assessing his RAC students on the job in the Solomon Islands.

Beginning as an apprentice in Newcastle, Michael Moller's love for the open water led him across the South Pacific, where he has helped local tradesmen formalise their refrigeration and air conditioning qualifications. In another in our series of articles looking at HVAC&R in daily life, Moller shares his journey, and explains how Australia is helping its counterparts in the Pacific Island nations.

I began in the industry as an apprentice with BHP in Newcastle in 1980.

After running a successful refrigeration and air conditioning business there for several years, I sold out, moved to the north coast and built a 12m traditional timber yacht.

I then sailed and worked in the Pacific for a number of years – installing and commissioning refrigeration systems, industrial ice machines, and on-board marine chillers.

A friend suggested I apply for a position as a trainer for the newly established Australian Aid program, the Australia Pacific Technical College (APTC).

It was a Howard government initiative designed to upskill Pacific Island technicians to the Australian Certificate III level.

As I had been teaching the electrical Cert III qualification at Wollongbar TAFE for 12 months,

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I had the required Cert IV training and assessment and RAC qualifications. So I applied and was successful.

In 2009, I started the RAC program in Samoa for the APTC, designing a curriculum and delivery strategy to suit the Pacific context and ESL (English as a second language) learners.



Presentation of prizes for winners of Environment Week Skills Challenge in Samoa.

My students came from all 14 Pacific Island Forum countries.

We had quite a diverse classroom!

Students would travel to Samoa for three six-week fulltime training blocks, and then return home to work. In between the blocks, I would work alongside them in their workplaces, allowing for a contextualised training environment.

I travelled to Tonga, Vanuatu, Solomon Islands, Fiji and Papua New Guinea (PNG) teaching students in their workplace on equipment that they were familiar with.

This model was extremely successful. It gave trainers an insight into the students' varied work environment, and it was an extremely successful educational model.

There are many excellent vocational educational schools in the Pacific that have certificate programs.

Unfortunately, these qualifications are not recognised outside of their countries.

The APTC allows students from both the formal and informal – those who have learnt on the job – sectors to bridge the gaps in their skills to attain the Australian Certificate III qualification.

In this regard, Australia plays a vitally important role, as increased skills and education is leading to further autonomy for Pacific Islanders.

For example, fisheries projects funded by the European Union have stipulated that installation must be completed by technicians with recognised qualifications. This would normally mean local businesses were not able to tender for the work.

During my time with APTC, I had several students from Tonga graduate – enabling them to tender for and win contracts from the EU, where previously this work was outsourced from Australia or New Zealand.

Unfortunately, the APTC has discontinued their RAC program, leaving an important training and educational gap in the Pacific.

Pacific Island students are possibly the best students in the world!

My students were always engaged and interesting in the training. They always arrived at the classroom before me and wanted to stay back in the afternoons. Many formed study groups on the weekends, and I would get phone calls on Sunday asking about something we had covered the previous week that they were discussing.

As they were always hungry for knowledge, I introduced “elective” units of study when we had time – on topics like PLCs and advanced wiring circuits. Every student, without fail, wanted to attend and complete these units.

Many students not only finished the Certificate III course but completed extremely complex programming exercises on the PLCs, demonstrating the highest level of competence in the trade area.

Of the 14 Pacific Island nations, only four have RAC vocational education and training (VET) schools: PNG, Samoa, Fiji and the Federated States of Micronesia.

Other countries mostly train their technicians informally on the job.

Unfortunately, curriculum and resources in existing schools are outdated and not reflective of industry trends. It will become increasingly important to update the resources with the decision to phase-out HCFC and move towards low-GWP options in the future.

Student numbers are decreasing due to a perception of low status of service personnel.

This is reflected in their remuneration. For example, a technician in Fiji earns around FJ\$6 to \$8 per hour (AUD\$4 to \$5) – not a great incentive to enter the profession!

Fiji and PNG have apprenticeship schemes; however, they are becoming less prevalent due to module-based programs designed for students who are not employed. These have become the more popular option.

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Most professional development occurs in the workplace.

Many larger companies conduct their own in-house training, which in some cases is extremely advanced. One company in Fiji, with over 200 employees, develops its own BMS software for installations. It also has its own training classrooms and brings in trainers from Japan for training on specific machines.

During my seven years in Samoa, I identified educational, skills and resource gaps that limited Pacific Island technicians from doing their jobs correctly. This led to increased emissions of ozone-depleting substances (ODS).

With the help of the Samoan government, we organised industry and community awareness events, such as the Pacific Refrigeration and Air Conditioning Symposium in 2011. This was the first time technicians, government bodies, wholesalers, and multilateral funding organisations had been together to bring about change in the industry.



Student Suvania from Tonga works on PLC.

As part of Samoa's National Environment Week, we ran a Skills Challenge.

It was a demonstration of RAC technicians, showcasing best practice in the industry. We had six teams of two technicians installing a split-system air conditioning unit on a free-standing frame. This was done against the clock.

The crowd woke up in true Pacific Island fashion, with many government officials on their chairs. People were screaming. One technician cut his finger, spilling blood all over the fan coil unit, but didn't stop – and he eventually won the event!

The competition was a great success in bringing ODS issues and industry skills to the fore in national environmental discussions. Previously, the issue of

ozone was left in the background, as it is a difficult issue to explain and motivate government ministers to become involved in.

After Cyclone Evan devastated Samoa in 2014, I noticed many domestic refrigerators left in front yards.

With the Samoan government and the local industry association, we conducted electrical checks of these refrigerators to see if they could be returned to service. If they could not, we offered to decommission and dispose of them. It helped hundreds of people and raised public awareness about recovering ODS.

Under the Montreal Protocol, and through the United Nations Environment Programme

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)

UNEP is the United Nations' designated entity for addressing environmental issues at the global and regional level. Its mandate is to coordinate the development of environmental policy consensus by keeping the global environment under review, and bringing emerging issues to the attention of governments and the international community for action.

www.unep.org

(UNEP) Multilateral Fund, plans are being implemented in developing countries to phase out HCFC.

Developing countries have extended phase-out schedules implemented by different multilateral agencies such as UNEP. I was asked by UNEP to design and deliver a regional education and training program for 12 Pacific Island nations on the phasing-out of HCFC.

Most recently, I organised a technical summit in Fiji on behalf of the Australian government, which introduced low-GWP refrigerant technologies to the Pacific. The summit was important, as Pacific Island governments and industry are assessing the implications of moving towards different low-GWP options in the future. They're also considering the impacts of existing technologies already in their countries.

The RAC industry is different across the Pacific.

For example, the dominant fishing industry in the Solomon Islands is heavily reliant on HCFC R22. In contrast, Vanuatu has a vibrant tourism sector moving towards low-GWP HFC refrigerant technologies in the split-system air conditioning sector.

Most countries have extensive land-based refrigeration and air conditioning systems for supermarkets and government buildings. Processing plants consist of multi-rack systems, as well as reciprocating and screw chillers using R22, R404 and R134a.

The first shipment of contaminated ODS is being organised from Samoa at the moment.

A common challenge in the region is dealing with stockpiles of contaminated ODS, as the only destruction facility is in Australia. While Refrigerant Reclaim Australia has been instrumental in assisting Pacific Island countries in the destruction process, transporting the ODS back to Australia has proved difficult.

There are considerable amounts of ODS in Papua New Guinea and Fiji, but they have no funding support.

Energy costs in Pacific Island countries are two to three times higher than in Australia.

The industry has generally moved towards more energy-efficient technologies such as HFC inverters. However, there are still low-cost fixed-speed R22 machines being imported from China.

Counterfeit refrigerants are also an issue due to a lack of resources in border controls.



APTC RAC program students – Ofiena (left) from Tonga and Patrick (right) from Papua New Guinea.



Australian representatives for the low-GWP technology summit in Fiji earlier this year.

MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL

The Multilateral Fund for the Implementation of the Montreal Protocol is managed by an Executive Committee with equal membership from developed and developing countries.

The 2016 Committee membership includes Austria, Belgium, Canada, Germany, Japan, Russian Federation, and the US (all developed countries). Developing country members include Argentina, Cameroon, China, Egypt, India, Jordan, and Mexico.

The main objective of the Fund is to assist developing country parties to the Montreal

Protocol, whose annual level of consumption of ozone-depleting substances (ODP) chlorofluorocarbons (CFCs) and halons is less than 0.3kg per capita, to comply with the control measures of the Protocol.

Currently, 147 of 197 parties to the Montreal Protocol meet these criteria.

As of November 2015, contributions made to the Fund by some 45 countries totalled over US\$3.44 billion (Au\$4.5 billion).

www.multilateralfund.org

One of the biggest challenges to phasing out HCFC is the cost. Having little or no import taxes on the refrigerant, it is relatively inexpensive, so there is no real incentive to change.

Pacific Island countries have ODS handling licenses in place, but there are no trade-based licensing schemes.

It means just about anyone can work in the industry.

As we have learned in Australia, trade-based licensing schemes raise standards, reduce emissions, and provide professional recognition for the skills and education technicians have attained.

RAC industries in Pacific Island countries are generally smaller and fragmented, and it makes the formation and running of associations difficult.

I am passionate about developing these refrigeration industry associations as a means for industry to have a say in the many policy and legislative changes occurring.

I have set up a regional network of technicians through a web-based platform. It has the capacity to link technicians into a regional association where they are able to support each other.

There is scope for Australian HVAC&R industry members to share their experience in many aspects of the industry.

Traditionally, the Australian and New Zealand HVAC&R industry members have entered Pacific Island markets as expat technicians for installation and servicing contractors. In the process, they informally trained local technicians on specific equipment.

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The decision to phase out HCFC/HFC and move towards low-GWP alternatives will pose many challenges to the RAC industry globally.

Issues such as toxicity, flammability, and high pressures will require a higher degree of professionalism in the industry. Australia should support Pacific Island countries in the lessons learnt from our experiences.

It is an extremely interesting time to be involved in the HVAC&R industry, with many changes expected in the future, both here and abroad.

Globally, there will be a need for education and training, policy development and legislation in developing countries.

Multilateral agencies such as the UNEP (United Nation Environment Programme), who are involved in development work, often advertise for professionals in the field. However, most require Masters-level qualifications for consultants. It's still worth checking out! ■