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# THE HEALTH ENGINEER



THE JOURNAL OF  
NZ. INSTITUTE OF HEALTH ESTATE AND  
ENGINEERING MANAGEMENT

## THE HEALTH ENGINEER

The Journal of the NZ Institute  
Of  
Health Estate and Engineering  
Management

Volume 4 No6 Summer 2009

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Cover Photo :- The War Memorial Convention Centre where the Conference was held, on Napier’s Marine Parade.

The health and viability of any organization depends on good communications. Our objective is to produce a good quality health engineering magazine. The magazine should inform readers, it should provide a forum for discussion, encourage interest in all aspects of the technical side of health facility management in its widest sense.

## President's Annual Report at 2008 AGM

A very warm welcome to the 72<sup>nd</sup> AGM and the 63<sup>rd</sup> Annual Conference of the NZIHEEM.

For this years conference we have moved away from the traditional four main centres and are hosting it in the city of Napier, in Hawkes Bay. Any earlier concerns about lesser numbers in a smaller centre have been well and truly allayed. Conference registrations started coming in early. We have just under 100 delegates registered including some 20 sponsors with 11 of these being major sponsors. There is about a 50/40 split in the Facilities and Biomed disciplines of those attending. This is an outstanding effort and everyone involved in the event should be proud including the conference organisers Paul & Pauline McCartney and Tony & Allison Blackler, conference sponsors, trades night suppliers & consultants, support personnel, etc., and especially to all those signed up to attend and make it such a success.

The annual conference continues to go from strength to strength and is the main activity our members associate with the Institute. It provides a much needed opportunity to meet with those in similar organisations and roles throughout the country, share knowledge and experience, be informed on latest products and system improvements, extend our visions for the future and generally partake of the all important healthcare networking experience.

Once again it is encouraging to note that there are a number of first time conference attendees. We are very pleased to welcome you. I'm sure you will find the conference experience stimulating and the sessions of interest and I look forward to catching up with you during the course of events.

Both Kevin Flower (Secretary) and Richard Whitehead (Exec member) are stepping down this year from the Exec after serving us well for a number of years. They have both played very important roles in the continued development of our Institute. I'm sure you will join me in wishing them heartfelt thanks for all of their hard work. Well done guys! We welcome Nigel Wing as our new Institute Secretary and offer him our full support in his new role.

During the past year our Exec has increased the level of communication via regular teleconferences. This has helped spread the load and seen a good number of initiatives under action. These include; consideration of strategic direction, survey of name change, a very successful submission to the PSA MECCA that provides for our some members to claim up to 80% of Institute annual fee from their employer, paid role of treasurer and membership secretary, changes and improvements to our webpage, etc.

The Institute continues to be represented in many areas of healthcare engineering, technology and facilities including EARB, Standards NZ and Australia, Electrical Workers Registration Board (EWRB), National Asset Management Leadership Group, Biomed Managers Forum, Facilities Managers Forum, etc.

I was fortunate to attend the recent IFHE International Conference in Barcelona and had the honour of representing the Institute at the International Council meeting the day before. The whole event proved an amazing experience with some 1000 conference delegates (one from Australia and one from NZ) and a great opportunity for interaction on a global scale with representative from all over the world.

We have worked closely with BOC on a review of their annual Award. It is pleasing to see a very good response in applications and we all look forward to the announcement of the successful applicant at the annual dinner on Friday night (see Journal article).

An important change of particular note is our proposal (following a national survey) to **change our Institute name from the NZIHEEM to NZIHE** (NZ Institute of Healthcare Engineering). This was passed at the AGM subject to confirmation by a postal vote from those members not in attendance.

The next 2-3 years will have their own challenges for our Institute. Among those areas we are focusing on are; continue to develop our strategic plan/direction, respond in a meaningful way to the evolution and integration of technology and biomed (clinical engineering), consider continued professional development for our members and the sector including the proposed IHEA professional development programme (certification grading status, certified healthcare facilities mangers programme).

Please remember that this is our organisation collectively, one that we are all proud to belong to. It is also a voluntary organisation and therefore requires involvement by as many members as possible.

Please put your hand up and make a contribution to whatever degree you can and also how about inviting your colleagues to become members as well?

Kind regards for the New Year - President Tony McKee

## International Federation of Hospital Engineering Conference

Barcelona 19-22 October 2008

Report by Tony McKee, NZIHEEM President

While in Europe I was fortunate to have the opportunity to attend the IFHE International Conference in Barcelona and had the honour of representing the Institute at the International Council meeting the day before. The whole event proved an amazing experience with some 1000 conference delegates (one from Australia and myself from NZ) and a great opportunity for interaction with peers and representatives at an international level.

The Council meeting was on Sunday and the conference proper over the following three days. Our Spanish hosts provided a great venue for the conference and an outstanding setting for the dinner, the Palau Nacional. With so many people and different nationalities it was amazing that the whole event went like clock-work. The programmes were well organised, very good presenters (some highly regarded internationally), friendly and helpful support staff, excellent food and beverages and warm Spanish hospitality.

It was evidenced by the number and global spread of attendees that the conference had very good locally and international support. I was interested to find that in some countries (for example, South American ones) it is an architect who is responsible for the engineering (including clinical) and facilities management aspects of their hospitals.

The technical programme offered a good variety of health topics. Following the opening and key note address there were two streams running simultaneously to choose from that were divided into themes as follows:-

Sustainability	Hospital Construction I
Telecommunications	Hospital Construction II
Energy	Safety
Maintenance	Quality of Infrastructures
Technology	Made for Healing
Medical Equipment	Actualisation of Design infrastructure
	Infection Control

Under each theme there were perhaps 3-6 presenters and often a number of other papers for reference reading. Abstracts were included with our notes. I understand that copies of full

papers will shortly be available electronically through the IFHE site. Should you have difficulty accessing any papers of interest please let me know.

As with most conferences one has to be very selective about which sessions to attend. One of the big advantages clearly was hearing the

international flavour on health. Overall there was a good variety with a number sounding only too familiar to that which we experience here in New Zealand. Some learning's and/or items of interest:-

### **We are all part of a global health community:**

Exchange of information is central to better and sometimes faster learning. While we need to continue to interact nationally so that we can share and try to learn from each other it is good to remember that we are also part of a "global health community."

### **Impact of Technology on traditional technical groupings:**

Demarcation lines are not as fixed between say IT/IS, Biomedical Engineering, Clinical Engineering, Electrical/Electronic Engineering, etc., as they once were. This is a real challenge for us to grapple with. Be prepared to embrace this change, see any gaps or problems as opportunities and for our part (also as an Institute) look for ways to assist a better outcome for the health sector.

### **Visualisation Tools:**

The more attention we give at the initiation of a new construction or refurbishment project as to how the service will be provided, whole of life costings, etc., the better will be our facilities from a service delivery perspective. Wider use could be made of visualisation tools (3D, etc) to support this process. In particular any that could assist with getting of our "not so technical" customers on board for looking at such aspects as work-flow analysis, potential problems with layouts, equipment placement, construction issues, etc., before our facilities get built.

### **Installation of Medical Equipment:**

Sometimes planning for installation of new equipment only starts when the equipment is already purchased which means that space arrangements are far from ideal and also construction / refurbishment has to be completed in an extremely short period. More active involvement is needed by engineering / facilities departments in the capital purchasing process.

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professionalism and integrity shown by all the staff interviewed. It also made it completely clear we have implemented stringent measures to minimise the risk of outbreaks, and that this is a problem for all hospitals.

"The C. difficile isolation ward at Maidstone Hospital where Panorama filmed is now much too big for that purpose because we have so many fewer cases - 35% down in the past year - so we have now transferred it to a smaller ward.

"The programme showed, quite explicitly, that our hospitals are very different and better places from how they were two or three years ago. I was also very pleased about the extremely positive things patients in the isolation ward said about the care they had received.

"We were completely open and honest with Panorama because that is our policy, and gave them full access to our hospitals - they filmed wherever and whenever they wanted to providing that patients were not inconvenienced, and were willing to be seen. We have nothing to hide and a great deal to be proud of."

### **'Superbug' cases now significantly falling at Trust**

Clostridium difficile cases have fallen by at least a quarter at Maidstone and Tunbridge Wells NHS Trust, figures from the Health Protection Agency (HPA) in late April show.

The Trust had 89 cases between April and June,

70 between July and September, and 67 between October and December last year, the HPA data reveals, while it is on course to see a 35% overall reduction in C. difficile in 2007/08 compared with 2006/07. Gail Locock, deputy director for Infection Prevention and Control, said: "Patients can be reassured that the measures we are taking to prevent healthcare-associated infections are working. Even one avoidable infection is one too many, however, and we are working hard to build on these improvements."

The Trust has also, it says, achieved the national target of reducing MRSA incidence by "at least half" from 2003/04 - 2007/08. For every 10,000 days spent in its hospitals in 2003/04, the Trust had 2.06 cases of MRSA. This dropped to 0.99 cases for 2007.

Maidstone and Tunbridge Wells NHS Trust also confirmed on 31 March that it had successfully undertaken all its "priority deep clean plans" due for completion by the end of that month. Its work in this area saw it receive praise on the standards achieved from Professor Brian Duerden, the Department of Health inspector of Microbiology and Infection Control.

A series of Improvements in hospital cleaning at all three of its existing hospitals, including the national deep clean initiative, formed part of a "£1 million plus" investment in additional staff, equipment and ward refurbishment during 2007/08 that the Trust says "contributed to the single largest reduction rates" it had ever seen.

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### **TB Facilities in South Africa:**

The emergence of new multi-resistant Tuberculosis (MDR TB) and extensively drug resistant TB (XDR TB) in South Africa has prompted the need for long-term acute and post-acute accommodation. Purpose-built facilities are required to accommodate patients for 6-24 months. The scale of the problem, need for simplicity in design and urgency for construction are all pressing factors. There are tremendous social and technical challenges. How to keep patients isolated yet not being in "prison," support for their family, no mechanical ventilation yet requiring very good natural ventilation, etc.

A thorough understanding on the transmission of TB and the origin of airborne micro-organisms was needed to ensure these issues were adequately addressed as well as the social, practical and construction aspects.

Overall I believe attendance at such a conference was an opportunity not to be missed. More particular perhaps for those of us tucked away down in New Zealand to have the occasion to interact with our international health peers and associates.

## BOC Engineer / Biomed of the Year Award

Given the tremendous response and calibre of the submissions received for the BOC Engineer of the Year Award the Exec has decided to publish the details of the nominations on an ongoing basis in this magazine, starting with this year's winner **Gavin Carey-Smith**.

Nominations were also received for:

**Bruce Hellyer** – Christchurch Hospital, Canterbury DHB

For an Emergency Dept. extension and refurbishment.

This was a complex project which had to be dovetailed with clinical services and an ambitious timescale and deadline. Excellent achievement brought in 1 month early with minimal disturbance to clinical service and maximum cooperation between services.

**Robert Raeder** – West Coast DHB

For services to WCDHB and for technical excellence.

Many hundreds of thousands of dollars saved through a tireless application of his skills and knowledge.

In particular Robert volunteered many of his own weekends and his considerable expertise to allow the construction of a new building to house Psycho - Geriatric long term patients to an affordable budget. His initiative allowed the building to be constructed to the original spec with natural light when the original spec was outside budget.

Technical Excellence - Design and installation of a prototype low cost O2 monitoring device on a boiler control system.

**Stuart Williamson** - Princess Margaret & Hillmorton Hospital, Canterbury DHB

Tremendous effort and collaborative approach resulted in turning engineering and maintenance staff morale around.

- Over and above the call of duty for reactive maintenance
- Cost reductions due to optimisation of plant, energy and resources
- Lead role in maximo database usage
- Organiser / coordinator of multiple projects

**Tony Blackler** – Canterbury DHB

Tony was nominated by Richard Whitehead of Wellington Hospital for his outstanding enthusiasm over many, many years and on many different stages - Standards Development, Biomed Development, Institute saviour.

Richard extolled Tony's dedication and commitment to ensuring that the technical health sector is represented nationally and his tremendous contribution to health care engineering overall.

It is testament to the calibre of the submissions, the difficulty the judging panel of myself, Kevin Bardsley of Waikato Hospital and Tracey Norton of BOC had in coming to the very difficult decision in awarding a winner.



Above Gavin being presented with his award by Tracey Norton and Jim Nesbitt of BOC at the Annual Gala Dinner in Napier.

## **Profile of Gavin Carey Smith and Précis of his winning paper**

Gavin is the Capital Projects & Energy Manager at Hawke's Bay DHB.

He has a Bachelor of Engineering Degree and an Engineering and Electrical Trade Certificate. His technical skills embrace industrial, commercial, mechanical and electrical trade experience as well as business management and manufacturing engineering experience.

### **Overview of topics covered in Gavin's paper:**

#### **ENERGY MANAGEMENT**

Energy conservation background. True energy savings.

Unseen expenses. Energy conservation looking forward .

Carbon footprint & greenhouse emissions total savings.

#### **ENERGY CONTRACT MANAGEMENT**

Electricity contract. Gas contract.

#### **CAPITAL PROJECT MANAGEMENT**

Capital project prioritisation. Capital approval process.

#### **HAWKE'S BAY HOSPITAL MANAGED PROJECTS**

Generator Upgrade. HCS Air Conditioning Upgrade.

Honeywell Energy Performance Contract.

Laboratory Air Conditioning & Nursecall Upgrade  
Energy Efficiency & Monitoring

#### **CONTINUOUS IMPROVEMENT**

Facilities Technical Library, Electrical & Mechanical Schematics

#### **INCREASED KNOWLEDGE**

Field Trips. Education & Professional Development.

Ongoing Courses & Training

As can be seen from above Gavin's paper gave an excellent detailed presentation covering a number of projects on energy management and conservation, carbon footprint reduction, upgrades to laboratory air conditioning and nurse call systems and a demonstrated commitment to continuous improvement.

In particular there was a strong emphasis on planning, directing, and coordinating, with a hands-on approach, projects and process improvements.

As Capital Projects Manager/Engineer, Gavin is responsible for managing a wide range of projects, contracts and energy conservation initiatives in excess of five million dollars annually. Running the projects requires in depth project management methodology, with sound analytical knowledge and problem solving skills.

Projects Gavin has managed have included energy improvements, construction, medical and clinical plant and equipment upgrades.

The paper covered Gavin's experiences in undertaking complete project responsibility from project initiation to project close.

This included negotiating, scheduling, estimating, budget control and scope management.

To manage projects accurately, Gavin had to set up project procedures which helped to mould a structured project management system that lined up with the Project Management Institute (PMI) standards of which Gavin is a member.

Gavin has made extensive improvements at Hawke's Bay DHB to existing administration systems, building services and engineering processes. These included, better as-built and document control with AutoCAD, enhanced control software, and better training and team participation.

He also used his engineering and electrical skills to work through technical issues, which entailed working under pressure to get equipment / plant back into operation and appointing appropriate resources and specialists for accurate results.

Designing and managing energy contracts and improvement initiatives were also covered as part of his role including tendering, selecting, negotiating and maintaining million dollar energy contracts. Energy conservation initiatives as part of direct and indirect capital investments were included which contributed to energy savings.

Unfortunately, due to the limited space available the papers cannot be printed complete. Above is a summary of topics covered in Gavin's winning paper. When the new Institute website is up and running this year, we will be including all of the submissions.....Cont. on page 24...

## Conference report, Nigel Wing Facilities

Well what a conference to attend. I certainly felt that of the conferences that I have been to since 2006 that this was the best one to date. Along with my fellow colleagues from Canterbury we felt that the coming together of facilities engineering and biomed health employees from around New Zealand a great experience. The interaction of meeting with fellow engineers shows to us we are not alone in the problems we face in a changing health care environment.

From the opening Chris Clark CEO Hawke's Bay set the scene of "our role in shaping the future" in health care engineering. It was good to hear him speak of his understanding of engineering and appreciation of what we do.

It was good to see that we had two speakers from the Ministry of Health Devon Diggle Thursday morning to the whole conference and Steven Pazin on Friday afternoon the grave yard stint to the facilities boys.

Devon gave an over view of the importance of good asset management plans and how critical these plans will be in the coming years. The linkage of the asset plans with the District Annual Plan and clinical needs. The assets we maintain need to be suitable and correct for the ongoing provision of health care. Health board asset plans will feed into regional plans and on to the ministry ensuring future services and the buildings required are correctly matched.

Devon's session linked well to a further session on Friday afternoon to the facilities stream only from Steven Pazin on capital investment in facilities for future. The presentation gave a clear view on the future allocation of capital from the Ministry of Health. The capital allocated will be for a project from start to finish with clear budgets outlined to completion. Steve also touched on the importance of operational funding and this was good to hear from a ministry representative. I have felt that new buildings have been built without any great thought on future revenue for maintenance.

Trade night, well what do I need to say. Another great evening spent mingling with fellow engineers and suppliers. This was an outstanding opportunity to mix with likeminded professionals and just seeing what the candy shop has to offer.

Friday morning brought a clear sunny start to the day with which we all eagerly awaited to see what activity Paul McCartney had organised for us. Running around the sea front in silly hats was not what I had thought of, with the highlight being attempting to catapult balls on to a green. The simplest of engineering task with a lack of materials, a bit similar to a day in the office maintaining health board infrastructure with a lack of funds.

The split into two streams brought us back to reality or more like an experience with the first facilities stream session a taste of what the future offers in "Integrated Design" with an exceptionally interesting presentation from Don Moodie of Opus. The use of three 'D' integrated design into future buildings will truly enable health professionals to experience the layout of a new building before it is built.

The future of fuel supplies or more importantly reducing our carbon foot print was brought home to us by Kirk Archibald from EECA on the wonder fuel of Wood, cheap, clean and abundantly renewable. To those of us in Canterbury this was a particularly enlightening presentation as we look at the future fuel stream for a number of our hospital sites.

The questions and answers session was a session of light the fuse and see what happens. It was very clear from the questions asked by fellow colleagues in the facilities' stream that we are all facing the same problems in our daily management of health board infrastructure. It was felt by all that an open forum part to the new web site which is under construction would be a good idea. Also the listing of surplus equipment and plant would also be a good idea.

I was equally amazed with how interesting a Labyrinth can be. Max Christensen's presentation on the relocation of The Amazing Labyrinth from The Frederic Wallis House to Hutt Hospital in 2007 was very interesting and enlightening. It even made one of my colleagues sit up when he recognised a picture of a hospital down the road from one he maintained in United Kingdom.

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Continued from page 11

All too quickly conference drew to a close and we all headed off to put our best threads on for the conference dinner at Church Road winery. I need say no more than it was an exceptional venue to end a great 2009 conference.

## Our Partners Conference Report, by Sue Ward - Timaru

Hello everyone and welcome to the report on the 63<sup>rd</sup> NZIHEEM Annual Conference partners programme.

Firstly I would like to thank again our host & hostess Paul and Pauline McCartney and Tony & Allison Blackler for a well organised and fun conference.

It was great to meet up with friends again and also make some new friends.

Pauline had organised for us to visit a few of the local tourist spots, we were picked up by Bob our coach driver and Bob gave us a full running commentary about the lovely art deco (The Jazz Age style) buildings and details about the 1931 earthquake which we all found very interesting.

Our first stop was the Silky Oak Chocolate Company for lovers of exquisite chocolate, wow! We were all given 3 samples to try then we were told how they were made, I am sure most of us made a purchase. We were able to visit the museum on the history of chocolate or just relax with a coffee in the café.

Second stop for the day was Napier Prison the oldest prison in New Zealand. Not sure how some of my fellow passengers felt when walking into this place but I sure felt a chill on the back of my neck as we walked from death row past the graves of the executed and into the hanging yard. Even though it was all very interesting hearing about the solitary confinement and seeing the damage the earthquake had done to the buildings and about the inmates I was pleased to leave the place. Monica was sure Mr. Edwards (inmate) left with her for the day as she had some funny instances happen to her after that ha-ha.

Well no bread and water for our lunch, Bob the coach driver took us to Missionview Gardens and the Wild Roses Café where we sat and had our leisurely lunch in amongst lovely rose gardens set on 2 ½ acres among century old elm trees.

We then headed back to Napier where some of us took part in some retail therapy, or relaxed at the hotel before getting ready for the Trade Night.

Friday morning bright and early, the partners took part in the team activity, I am not a morning person so this was a challenge for me; we put ourselves into groups and put on some weird hat then ran or walked about Marine Parade doing challenges finding information etc. Sorry girls but to my surprise we came in fourth I thought we would have been at the bottom, so well done to my fellow teammates.

After freshening up we were picked up by our new coach driver Grey and we headed off to the Arataki Honey Centre for a sweet experience. You were able to look at honeybees' under microscopes or watch the worker bees up close in the giant hive. We were able to taste a range of different flavours of honey, try hand creams and smell different soaps. A great place to do some early Christmas shopping.

Grey then took us to the Te Mata Cheese Company. We were greeted on arrival and seated at our table where we were given 4 cheeses to taste, most of the group were cheese lovers but for some of us a few faces were pulled when we tried them especially Pakipaki a white rinded goat's milk cheese and Bay View Blue a creamy blue cheese. We were told and shown the cheese process and how to store cheese at home. We had our lunch here and of course they used their cheese in every dish served.

The next part of our excursion was a bit hair-raising as our coach driver Grey took us up Te Mata Peak. A motorbike had to go ahead of us to make sure the road was clear of on coming traffic. Boy what a view, you could see all over Hawkes Bay; the wind was a bit chilly so we did not stay long.

We spent our Friday evening at Church Road Winery, where we were treated to, lovely wine and a meal. Various awards and accolades were handed out, thank you speeches were made and we all relaxed and enjoyed ourselves.

Saturday morning feeling a little bit jaded we all parted to other parts of the country but with very fresh memories of a very colourful and delightful town Napier.

I thank you for your company and look forward to seeing you all in Hamilton in 2009.



## ANZEX Delegate Trip Report

By Brendon Groufsky

The 58<sup>th</sup> IHEA Conference venue for 2008 was in Canberra which meant that my wife, Val, and I had all of NSW to consider for hospital visits. We decided to spend the first week of our trip in Sydney where we made five hospital visits. Not being sure how long each visit would take we stayed on the conservative side and arranged for one visit each day. Looking back now we definitely made the right decision. Even though the public transport system is great, it still takes a while to get to where you want to go. Couple that with the great tour guides we had at each venue, meant we would not have been able to fit in more than we did.

Sydney Adventist Hospital was our Thursday visit and Bernard Jakovac was a very enthusiastic host. Bernard did not really know about the IHEA and how it all worked. One thing that surprised him was how the information about our hospitals flowed so easily, even the not so good bits. I explained to Bernard that was one of the big benefits of the Institute where we all shared our experience so that we all, hopefully, didn't have to go through the same problems. Sydney Adventist is a private hospital and you can see the difference between public and private.

The one common thing is that we all share the same issues good and bad.

Rain greeted us on Friday but as soon as we were met by our host at Royal North Shore Hospital, John Wilson, had us forgetting about the weather and enjoying the visit. Some development of the site is underway and demolition for some of the buildings is not far away. A new laboratory building had been finished but not open for use so it was great to go through that and see how it was laid out. We said good-bye to John but it wouldn't be

too long before we saw him again at the conference in Canberra.

We had Saturday to ourselves in Sydney and then caught the train to Canberra on Sunday. Mitch Cadden and Brett Petherbridge (the main conference organisers) met us at the train station, dropped our bags at the hotel and then it was off to the pub for the beer. These guys had a us laughing in no time certainly made us feel very welcome in Canberra. After a dinner with the boys, we head back to hotel to get ourselves organised for the week.

Monday morning and the boys picked me up to go through Canberra hospital. Val went shopping for the day as, although she really enjoyed the visits we did in Sydney, she need some retail therapy. Mitch and Brett used to work together at Canberra Hospital and Mitch is now at Calvary Hospital in Canberra. We had a great look around the campus, once again seeing everything I wanted to see and more. After lunch I was dropped off at the hotel and caught up with Val.

We had Tuesday to ourselves and explored Canberra, which reminded us of Christchurch in so many ways, so it felt like home (just warmer).

Wednesday was the technical tours which were the Parliament buildings, which were really good and the National Australian University, which was fantastic. There was so much to take in on these tours and I am so glad I took zillions of photos to remind me of what we saw.

Conference started on Thursday and after the opening ceremony we were straight into the papers. Unlike New Zealand, there is only one stream for the papers so everyone was in the same lecture theatre. All the papers were of a high calibre with a good mixture of member and professional papers. The theme for the conference was living within the environment and there are certainly a lot of good things happening out there with green buildings, water and energy conservation and so forth. I presented my paper in the afternoon which I think went over well. It was good to see the trans Tasman rivalry at work. A couple of sheep jokes aimed at me but it was great that just before the conference the All Blacks beat the Wallabies and that Robbie Deans was coaching, so I had it covered all ways.

The conference was run in a similar manner to ours in that the Thursday night was trade night, Friday papers and then the banquet on Friday night.

This came around far too quickly, just as we were getting to know all of our new mates, it was time to say good-bye.

get on the bus on Saturday back to Sydney then on the plane and home at lunch time on the Sunday. Unpack, pick up the dog and cat then get ready for work on Monday. Oh yeah and catch our breath!

The trip was extremely enjoyable. Everyone was friendly and nothing seemed to be a bother. I am grateful to the Institutes on both sides of the Tasman for the opportunity to be ANZEX delegate and I would recommend it to anyone.



Back row from left: Peter Downey, Val Groufsky, Brendon Groufsky, Brett and Mrs Petherbridge, John Wilson.  
Front row, crouched, Mitch Cadden.

## Temporary Diesel Generator Connection

Brendon Groufsky

What do you do for emergency power, when your in-house stand-by diesel generator needs servicing?

That was the question I was faced with when I was in my previous role as the electrical engineer at the Canterbury DHB. The fitters and electricians carried out the day to day maintenance checks, which did not require the sets to be out of service. However, once a year a contractor would come in to service the units which would put the sets out of service for at least a day.

With the increase in reliance on electrical systems within the hospital, having a set unavailable was simply not an option. In the past when major worked was carried out on the in-house sets a containerised temporary generator was brought in. Connecting this to the existing infrastructure and getting it to start on a mains failure was a bit of a nightmare with main switchboards having to be, literally, pulled apart to allow the cables to be connected. Remembering, of course, that during the connection time there was no standby power available at all!

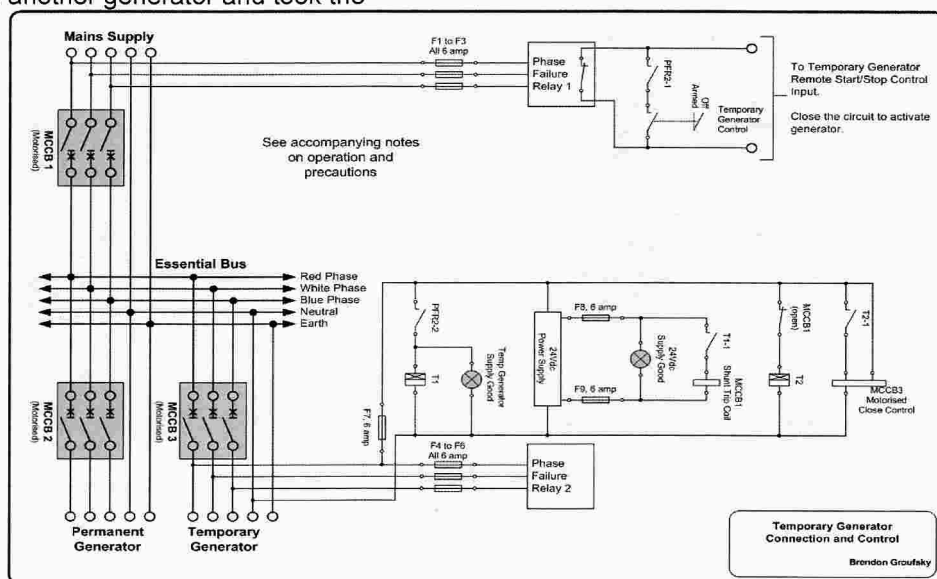
During the upgrade of one of the generator control systems, I designed a solution to allow a temporary generator to be connected more easily. This eliminated the need to pull the switchboard apart and could be done with the in-house set still in service. This worked very well and with the installation of a 'cat flap' on the generator house door, the temporary cables could be left in position indefinitely and the building locked. A bit of jiggery-pokery was still required on the controls front and this frustrated me as there was no quick way of getting a temporary generator installed.

We then employed ABB to perform an upgrade to the controls of another generator and took the

opportunity to install a *Mark II* version of the temporary generator controls which has been used as the standard ever since. The circuit diagram shows the circuitry used and as you can see it uses only a few components, and is very simple in its operation, but very effective.

In Canterbury the generators are run automatically by the network company to shed load on the grid. Therefore all the generators have synchronising controllers and motorised moulded case circuit breakers (MCCB's). There is a mixture of 24Vdc and 230Vac closing and trip mechanisms on these MCCB's, but I prefer the 24Vdc as you can at least operate things when there is no power at all. As an aside, the GE Woodward EGCP-2 controllers are used and I would not use anything else. These controllers are straightforward to install and set-up and can run sets in parallel.

Back to the circuit diagram. MCCB 1 supplies the essential bus in the switchboard from the mains supply. MCCB 2 connects the in-house generator to the essential bus. Both of these breakers are normally controlled by the Woodward EGCP-2 and will both be closed when the sets are running synchronised.



When the in-house set needs to be out of service a containerised set is delivered to site and its power cables are connected to the terminals of MCCB 3. A twin core cable is connected from the remote start terminals of the generator to the controllers remote start terminals (top right on circuit diagram). The temporary generator is then run manually by shorting the remote start terminals, phase rotation is checked and then it is shutdown.

At this point in time the in-house generator controls are turned off and isolated, MCCB 2 is locked open and tagged, then the Temporary Generator Control switch is turned to the ARMED position. The temporary generator is now set to auto-start. It is best to now perform a mains fail test to make sure everything works.

The system operates like this:-

If the mains fails, this is detected by Phase Failure Relay 1 de-energising and its contacts closing. This shorts the remote start control wires and signals the temporary generator to start. Once the set is up to speed, Phase Failure Relay 2 will activate and close contacts PFR2-1 and PFR2-2. Contact PFR2-1 provides a parallel remote start signal, which I will explain later. Contact PFR2-2 will power a timer that closes contacts T1-1 for three (3) seconds and then opens them again and remains in that state until control power is removed, i.e. the temporary generator shutdown.

Contacts T1-1 closing will put 24Vdc to the shut trip coil of MCCB 1 to open it. The three second timer prevents power being on this coil all indefinitely and burning out. Tripping MCCB 1 will stop any generator power back feeding the grid. The 24Vdc power supply is used here as the shut trip coil on this switchboard is 24Vdc. If a 230Vac, or any other voltage, trip coil is used then alter the circuitry as necessary.

Once MCCB 1 has tripped, then a set of auxiliary terminals in MCCB 1 will put power to Timer T2. Contacts T2-1 will close for three seconds then open again (just like T1) putting power onto the motorised mechanism of MCCB 3 which then closes. Generator power is now supplying the essential load. In reality this process takes about eight to ten (8-10) seconds.

As you may have worked out, this circuitry gets the essential load on to generator but it is not designed to take the load back to mains when it returns. I decided that would be too complex and not warranted because you are going to be back on-site if the mains fail anyway.

When the mains return, Phase Failure Relay 1 will activate and open the contact that tells the temporary generator to run. Normally this would tell the generator to stop and essential power would be lost. However as contacts PFR2-1 are still closed the generator will keep running. When you have arrived on site and determined that all is well and your load can go back to mains, the following sequence is used.

- Manually trip MCCB 3. This will not attempt to close again as the close signal was only applied for three seconds.
- Manually close MCCB 1. This will put the essential load back on mains supply.
- Turn the Temporary Generator Control switch to OFF and the generator should shutdown after a cool down period.
- Once the generator has stopped running;
- Turn the Temporary Generator Control switch to ARMED and the system is ready for the next mains failure.

Getting the essential load onto generator is the highest priority, so as far as I am concerned that is the primary task and this circuit accomplishes this very well. You then have the option to go back to mains when you are ready. For example if there was a storm going overhead, you may elect to stay on generator rather than have the mains out several times.

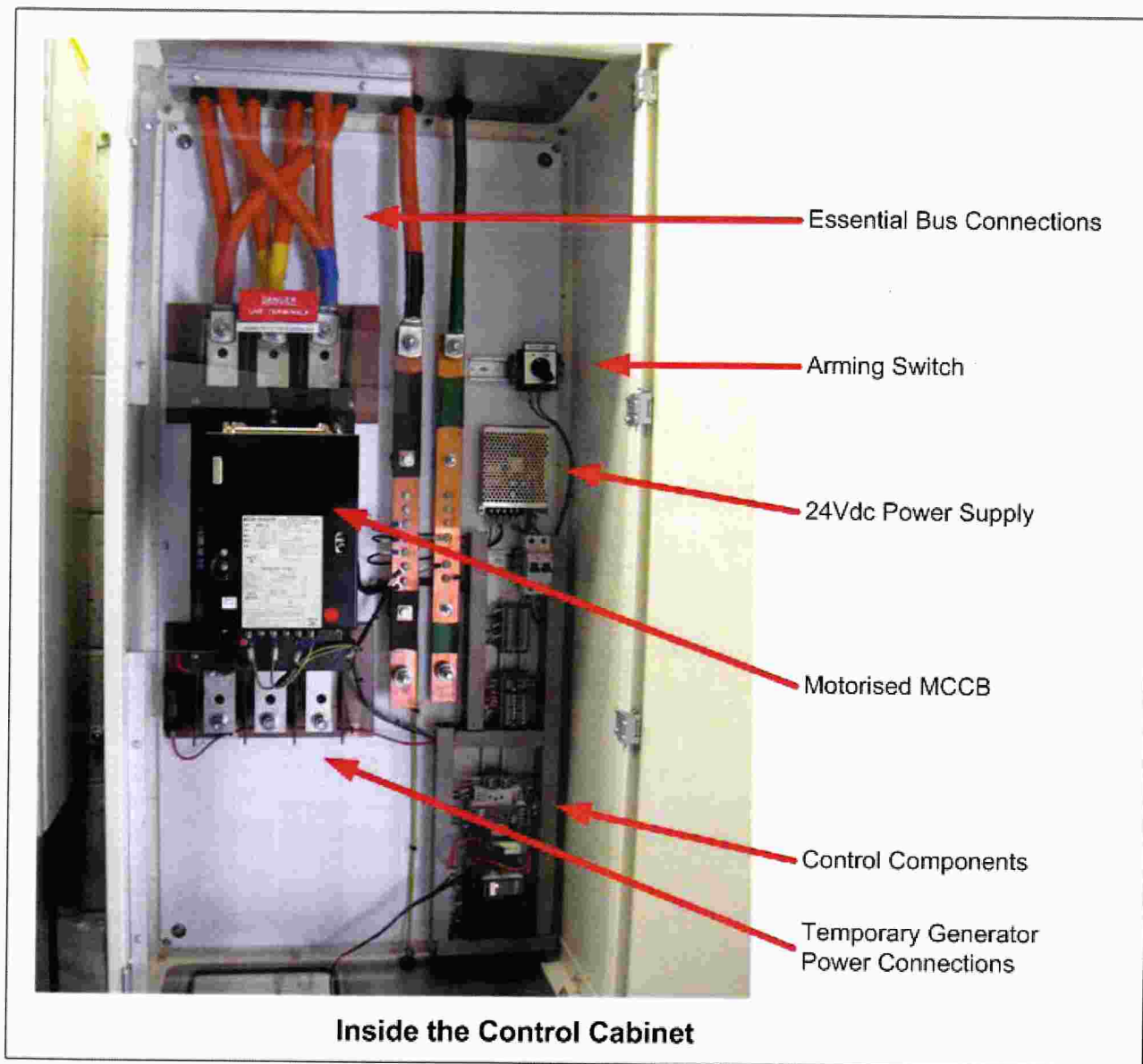
Three points about the circuit as well.

- The three second pulse to trip and close the MCCB's is a once only event. If the MCCB's do not trip or close then essential power will not be available. Additional controls could be added to apply the trip or close pulse several times or a set of auxiliary contacts could be used to determine if the MCCB has tripped or closed and reapply the pulse until it does. These mechanisms are seen as pretty reliable so this was not installed.
- Some containerised generators need an open circuit to run and closed to stop, so an interposing relay would be needed. This may require the use of an external source of power such as a 24Vdc battery or the like. Some phase failure relays have changeover contacts in them, so the circuit could be adjusted as needed.
- I am a big fan of indicator lights as they help fault find and give a quick visual indication of how things are. LED's are certainly my choice for longevity and reliability. These

- could be added to show the position of the MCCB's, what power is available from where and so forth. One of the reasons I like indicator light is during an outage or similar event. When you are running past a control panel or switchboard, you can glance over and if you only see green then keep running. If you see amber, slow down a bit and have a look and if you see red then stop because something is wrong. Simple but very effective in an emergency.

There is probably a lot more you could do with this circuit, but the idea was to keep it simple and get stand-by power on as quickly as possible. I am more than happy to discuss this further and I can email the drawing to you if you want it. I can be reached at:-

Canterbury DHB  
 Site Redevelopment Unit  
 Ph 03 364 015  
 Email [brendon.groufsky@cdhb.govt.nz](mailto:brendon.groufsky@cdhb.govt.nz)

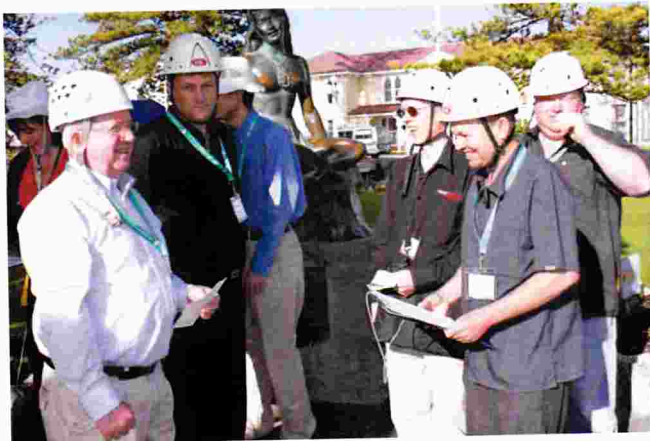




Kirk Archibald talking about wood energy



Max Christensen presenting his talk about shifting the “Amazing Labyrinth” to Hutt Hospital.



The “A” team with Pania on the Friday morning outing.



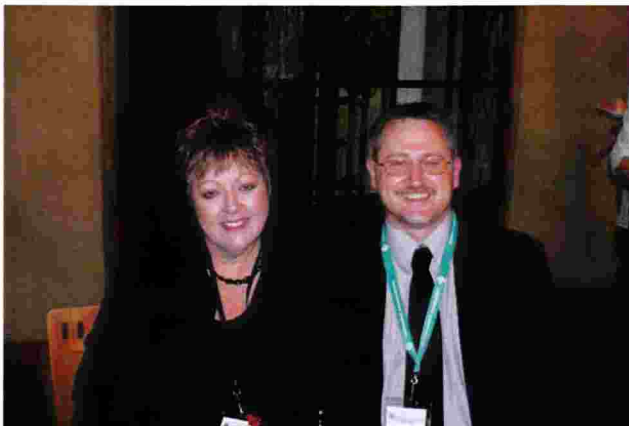
The Ebos Display was highly interesting at Trades Night



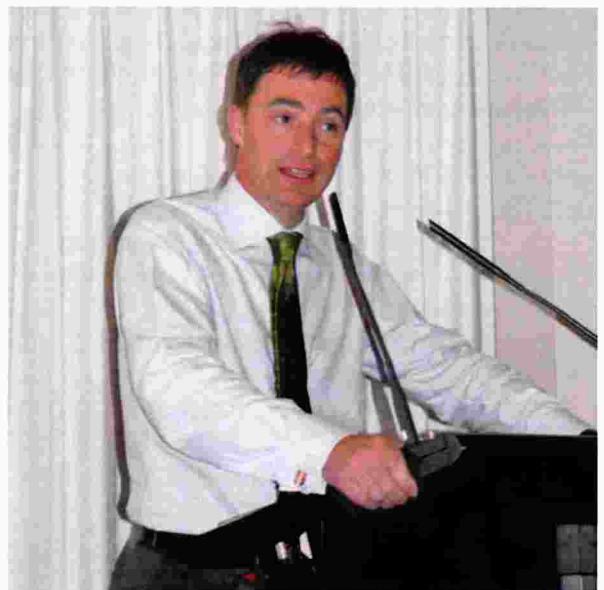
The Executive on a lunch break, from the left ....  
Jim Logan, Kevin Flower, Tony McKee, Kevin Bardsley,  
Richard Whitehead, Nigel Wing, Bill MacDougall, Len  
Mumm, Tony Blackler.



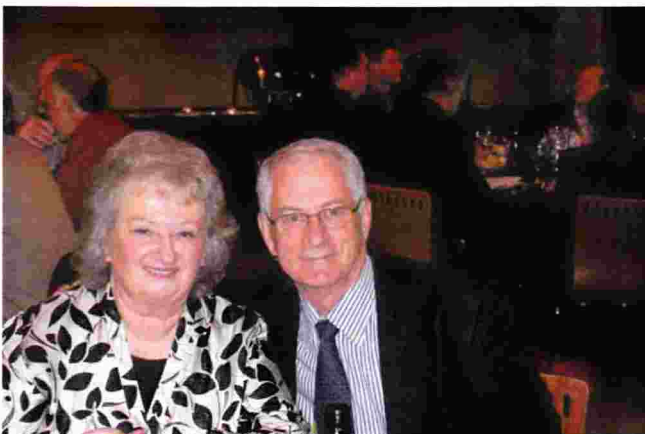
President Tony McKee opening the conference



Conference organizers – Pauline and Paul McCartney



Chris Clarke, CEO Hawkes Bay DHB delivering the keynote  
address



The Australian ANZEC delegate Len Mumme and wife Faye.



## Presenting a Paper

With our very successful conference at Napier finished for another year it would be appropriate to look ahead to our next conference in Hamilton. We should all ask ourselves "do we have enough information about a subject to present a paper?" Now is the time to start preparing for this presentation. With this in mind here are some words of wisdom from Jim Meldrum, past general secretary of the I.H.E.A., on how to go about presenting a paper at a conference.

### **How to Write & Present a Technical Paper** **A Discussion Document** **from** **Jim Meldrum**

The suggestions as written below are an idea as to how to write & present a technical paper to the standard as delivered at conferences of the Institute of Hospital Engineering, Australia. (I.H.E.A.).

This document should be made available to all I.H.E.A. members. It is aimed at those persons who would like to do such a thing, but, perhaps, lack the know-how of:-

- What to write,
- What to leave out,
- The order in which information should be delivered & perhaps, more importantly...
- The confidence to stand up & publicly speak

Having experienced public speaking & writing 'Technical Papers' I would suggest that the format should be as follows:-

- Know what you want to say,
- Have a 'start', a 'body' & an 'ending',
  - Where are we now?
  - Where do we want to be?
  - How do we get there?
  - How will we know when we have got there?
- Do not over-burden the audience with an excess of technical data,

Taking these points a little further I will elaborate:-

#### ***Know what you want to say.***

Let's assume that something extra-ordinary has happened either at your place of employment or close by.

- You played an important part in this event
- This event has significance.
- You feel most anxious that your fellow Hospital Engineers should learn from your experience.

You may already have been asked by management to provide a report on this event. This report may be read by the Board of Management, so you are cautious in what you write in case you should be found wanting in some aspect of your professional conduct. You may also have invited a 'peer review' of this report prior to it being tabled. This report could be the basis of your 'Conference Presentation'.

**Have a 'Start', a 'Body' & an 'Ending'.**

Your opening remarks should provide an overview of the status-quo before the event, an explanation of what then happened & finally how any challenges were met.

As an example let's assume that you have taken delivery of an 'Energy-Saving Device'. This 'device' - let's say it is an automatic boiler - has been calculated to save a decent sum of money.

**The 'Start'**

*What was the initiator of this event?* You begin by relating historical background information about how you inherited the old 'Steam Plant'. It was in-efficient by today's standards, it relied on 'Boiler Attendants' to drive it & it took up a large 'footprint'. After wide-ranging consultation with Management, with prospective suppliers & with other internal departments who may / will be affected, a plan is drawn up. This plan benefits all concerned. Money currently being expended on 'Energy' can be spent elsewhere, your (now redundant) Boiler Attendants are redesignated as 'General Usefuls' & are given tasks that have previously never been attempted due to lack of staff. The space taken by the newly-removed boilers is all, or partly re-allocated either to your own department or to another department. Everyone is happy.

**The 'Body'**

The area surrounding the incoming boiler is prepared. New / additional steam piping is arranged & suitably insulated. Electrical reticulation is complete. The boiler arrives on site & is installed / tested to satisfaction. Change-over occurs & minor issues experienced. Redundant boilers are removed (not without difficulty) & taken off site by a 'low-loader'. The now-redundant steam-piping crossing the internal roadway is found to be not high enough for the boilers to pass under. These pipes are insulated with Asbestos & cannot be touched without due precautions. An alternate route is agreed upon. New boiler plant settles-in & all is well.

**The 'Ending'**

- What did we learn?
- What tips can I pass on to you?
- What should I have done in hindsight that would have made the installation smoother?
- What extra finance was involved that was not envisaged?
- Has the saving in fuel met the expectations?
- Has Management tried to make all/some ex-Boiler Attendants redundant?
- Who won the 'additional space' & how was it used?
- Summary.

**The Presentation/**

A decision as to the format of the presentation should be made early on in the preparation of your paper:-

- Will this be a 'Power-Point' presentation? If so, then will photographs add to its agreeable reception?
- Are suitable photographs available?
- Will the required computer/projection equipment (to allow the chosen format to be delivered) be available at the venue?
- How many minutes (including question time) will be allocated to me for my presentation?
- How many minutes (after a rehearsal) did my presentation take?
- What more material can I add & what can I delete without altering the 'thrust'?
- Is this conference 'Themed' in the sense of what other papers are being presented on associated issues? Your paper should emphasise this theme if possible.

You should be aware of the judging procedure as implemented by the IHEA. This procedure is currently available on the IHEA web-site & should be understood by all

- presenters. If you aspire to be the winner of the 'Best Paper' award, then as far as possible your presentation should meet all categories.
- Carry-out a 'spell-check' on all material to be shown.
- When satisfied with your presentation, then have it 'peer reviewed'.

### ***In general/***

You should prepare a short account of your career to date, your current responsibilities & interests. This will be read to your audience by the 'Session Chairman' when you are introduced.

### ***Public Speaking/***

It has been written that the human brain is a wonderful thing. It functions perfectly well right up to the moment when you step upon the podium!

It is never easy presenting to an audience & those who would argue this point may find that they are becoming cynical.

However, there are some points that will make this opportunity fondly memorable for both you & your audience:-

- Speak confidently. After all, you are the person with the knowledge. Nobody is sitting in the audience awaiting the opportunity to pounce upon you & hold you up to ridicule.
- Read all material as though you were in a conversation. Modulate your voice appropriately.

- Be smartly dressed. It is better to 'dress-up' than to 'dress-down'.
- Ensure that the microphone is correctly positioned. Do not speak too closely into it.
- Be well rehearsed & speak lucidly.
- Do not rush the presentation, nor gabble.
- Ensure that all coughs / sneezes are directed away from the microphone.
- Make eye-contact with your audience at regular intervals & avoid the 'head-down' syndrome associated with lecterns that are not high enough.
- Ensure that any written material is of a sufficiently large font such that your eyes can quickly refocus when returning to the words after having made this eye-contact.
- Have all supporting literature & / or accessories to hand. Acknowledge the source(s) of your reference literature / quotes, where possible.
- Have assistance, where necessary, to activate overhead projectors, to display artefacts, hand out brochures, dim the lights / etc.
- At the end of the presentation thank your audience for their attention.
- Step back two paces & bask in the rapturous applause.
- Allow reasonable time at the end of your presentation for questions to be asked of you. Some background material should be on-hand to further emphasise the 'thrust'.
- Do not spend an inordinate time debating a point with a questioner. Leave that until later.

Jim Meldrum  
November 2006.

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Continued from page 10....

in the Members Only section, so please bear with us. Please use this as a spur to galvanise you into action to either self nominate or nominate a colleague. We look forward to receiving an even greater number of nominations for this prestigious award in the coming year.

Bill MacDougall, Immediate Past President