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THE HEALTH ENGINEER

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The Journal of the NZ Institute
of
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Contents

Cover Photo :- Schneider Electric's "state of the art" offices and warehouse, scene of the Conference site visit.

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 for the NZIHE 2010

We held our 74th AGM towards the end of our 65th Annual Conference in Auckland in November 2010. Our Conference theme this year was "Getting More from Less." The conference proper had an excellent programme prepared for us by Bill MacDougall. There was also an exciting Partners Programme prepared by his lovely wife Lyn which included a day trip to Waiheke Island! Another good turn out for the conference and great to catch up with so many of you there.

One significant event this year which has captured the attention of NZ was the major earthquake in Christchurch. I suspect we could all agree that it was a miracle the human injuries were so minimal in comparison with the magnitude of the quake and the damage it caused. From an Institute perspective we are all proud of the fantastic job our colleagues did at Canterbury District Health Board in keeping all of the hospital services going.

The event provided a timely reminder of how important the supporting services are which we and our suppliers provide to hospitals and DHB's generally. For example it would be impossible to run a modern hospital effectively without the basics like power, water, drainage, properly functioning clinical equipment, etc. There will be some worthwhile learnings to come from this event for each of us. We need to maximise the opportunity and look to putting improved systems and processes in place to reduce the effect of any future incidents. There was a very attentive audience to the presentation at the Auckland Conference from Nigel Wing and Tony Blackler about the impact of the Christchurch earthquake on the DHB. As a follow up we are planning a national seminar/workshop in collaboration with Canterbury DHB in Christchurch early in the New Year.

It has been another busy year in the health sector. The Government has clearly identified the heath targets each DHB is measured against on a month by month basis. So far there have been some really encouraging improvements on these right across the DHBs. Financial sustainability probably remains one to keep an eye on as we all look to see how much leaner we can get.

Some Institute initiatives and interesting items over the past year to mention include:-

Exec Meetings
The teleconferences continue to be an effective method of engaging with Exec members during the year in a less expensive manner and within our very busy schedules.
However the midyear face-to-face Exec meeting at Counties Manaku DHB was appreciated by all. John Black did well in hosting our meeting. There are some added benefits in meeting as a group once a year including the informal conversations and support in what is usually a stressful health environment. There were a number of issues that need discussion and decisions including some of the following.

Engineering Associates Registration Board (EARB)
It was pleasing that our nominee Tony Blackler was confirmed by the Dept of Building and Housing (DBH) Minister Maurice Williamson to the EARB for a further two years. Thank you to Tony for the time and all of that hard work provided on our behalf.

Treasurer and Membership Role
Allison Blackler continues to make a significant contribution to the Institute especially on the operation of these two key roles. With our continued busy lives I am keen to explore if and how this could be extended to provide some much needed support in progressing the profile of the Institute and a number of the other bright ideas coming forward. Should we perhaps investigate further the Australian model or some other approach in

resourcing our good ideas or maybe just continue to focus on what we do well – the Annual Conference? These are areas for ongoing discussion and consultation.

BOC Award
The Award has been a generous and worthwhile scheme for members in the past whilst providing a good profile for both parties. In consultation with BOC we are now looking to re-configure the scheme and will provide an update on this as and when agreement is reached.

Web Page
The page has been up and running successfully for the past 12 months. It has been great to have the biographies of retired members on there. They are well worth a read. However we need to consider how to stimulate general contributions and use by members and in particular from the Facilities discipline.

Regional Meetings
Please continue to support your local regional meetings. There was only one meting held during 2010. This was a very successful South Island one held in Christchurch and concluded with an enjoyable meal with partners at the "Holy Smoke" restaurant. Please consider what you can do to support one in your region and don't hesitate to put your hand up to organise or support.

ANZEX
The Australian ANZEX delegate this year was Michael Della Franca from Perth in WA. Great to have Michael join us at the Conference and visit a number of our DHB's. He got to meet a number of people both on the visits and at the conference. Well done to all of our hosts in providing the usual Kiwi welcome to our Australian guest.
Doug Moller attended the IHEA Conference in WA during September as our ANZEX delegate for 2010. As you will have heard this was a really worthwhile experience for Doug and his wife Tric. Anyone thinking of possible future selection should contact Doug and find out more.
Like ourselves the IHEA is very supportive of this programme. I understand they have implemented some additional processes within their Institute to ensure consistency and standardisation of approach which has been a concern to us over the past while.

Congratulations to Ian Ward from South Canterbury DHB who is our 2011 ANZEX delegate.

Institute Journal
Our Journal maintains a significant link with members and the health sector at large. Jim Logan continues to provide the coordination and editorial service that delivers such a fine publication for us. I would encourage you to contact Jim with any items of interest for inclusion.

And lastly as your Executive Committee we continue to re-evaluate our modus-operandi and where appropriate make changes in the way we and the Institute operate. Our main focus remains the annual conference. All the positive feedback from the Auckland one once again confirmed that this activity continues to provide some real benefits to our members - excellent technical presentations, sponsor involvement and social activities.

All the very best for 2011.

Tony McKee
President NZIHE

'ADRENALINE' MOLLIFIES EARTHQUAKE'S IMPACT

Alan Bavis, Facilities and Engineering Manager at New Zealand's Canterbury District Health Board (CDHB), based in Christchurch, explains how well-rehearsed contingency planning procedures, reliable, well-maintained plant, and an "excellent team spirit", combined with "sheer adrenaline", helped he and his estates team keep vital hospital services running in the aftermath of the major earthquake which hit the country's South Island in September this year.

On Saturday 4 September this year at 04.35 hrs Christchurch in New Zealand was awakened by the full force of a 7.1 magnitude earthquake, the most damaging such event in a highly populated area of the country since the deadly magnitude 7.8 Hawke's Bay (Napier) earthquake in 1931. There was, however, one very important and fortuitous difference this time - there was no loss of life. This was partially due to luck, as the earthquake occurred at a time when most people were in bed, and the streets were sparsely populated. However, the lack of casualties was mainly due to New Zealand's strict building code, which aims to ensure that buildings do not become death-traps in a major earthquake. The event, although only 40 seconds in duration, seemed to last for much longer, and created massive amounts of damage to roads, infrastructure, sub-divisions, and commercial buildings, within the city's central business district and outlying suburbs and townships. The epicentre was located 30 kms west of Christchurch near Darfield at a depth of 10 km. It was felt throughout the South Island, and as far north as New Plymouth in the North Island. As I write (in late September) there have been in excess of 1,000 aftershocks, and the University of Canterbury has calculated that, on average, an earthquake of magnitude 2.0 or above has happened every 29 minutes since "the big one" on 4 September. The 7.1 event has, it has been calculated, been responsible for 97% of the total released energy, with all of the after-shocks to date accounting for the other 3%. Some of these after-shocks have also been quite severe in nature, and have caused further damage to already weakened structures.

Extensive area to cover

As Facilities and Engineering Manager at Canterbury District Health Board, my responsibilities encompass the entire building portfolio, from the major metropolitan hospitals in Christchurch to many smaller hospitals and clinics throughout the region - which, in turn, encompasses an area from Ashburton in the south to as far north as Kaikoura. My team is spread over the sites, and numbers 64 in total, and I have eight direct reports. We utilise a mixture of inhouse staff and external contractors and consultants to meet the varying aspects of the workload. Although we have plans in place for such events, the "real thing" was quite unexpected, testing not only the structural integrity of the buildings and infrastructure, plant, and equipment, but also proving quite a test for the staff. I am not sure that any of us could have predicted how our team would react to such a situation; in the event I can only describe the response as "magnificent". It is testament to the character of the staff working in this sector that, by nature, they do a lot with little, are problem-solvers, and manage risk on a daily basis. It is during times of emergency that their amazing capacity to get things done and make things work again, sometimes by ingenious means, comes to the fore. The magnitude of this earthquake was the largest experienced in a densely populated area of New Zealand for nearly 80 years, and it is thanks to the strict building codes, good standard of construction, efficient installation and maintenance of plant and equipment, and quick reaction of the staff, that the various healthcare facilities not only stood up, but continued to remain fully operational, in most cases, despite localised damage.

Emergency systems 'worked as designed'

All of the buildings' seismic joints and base isolation modules, as well as emergency systems such as UPS and generators, worked as designed, and managed to keep the sites running in standalone mode. Immediately after the event, and for some time thereafter, there was no incoming electricity supply, no water supply, and a great many competing priorities for our time, which we had to manage carefully.

The immediate aftermath

I was contacted by my youngest son about 15 minutes after the event to see if we were okay. He told me that he was stood in the back garden of his property, and that water was coming in over the top of his gumboots, yet he doesn't actually live near any water. The whole of his suburb had suffered liquefaction, and his house had sunk unevenly on its piles and is now uninhabitable. It is still not certain whether the land can cost-effectively be recovered for building on again, which means that some suburban areas of Christchurch that have suffered liquefaction have had to be abandoned until there Is greater certainty on the issue. After speaking to my youngest son, I made a quick call to my eldest, who could not get out of his driveway, as his next door neighbour's chimney stack had fallen onto his car and caused some damage. My daughter is in London at the moment, so at least there were no worries about the impact of the earthquake on her. After having made sure that all of my family were safe, and extracting myself from what used to be an orderly and tidy house, but which was now littered with ornaments, books, broken shelving, book cases, and crockery etc, I said goodbye to my wife and headed for work. When I left home we had no electricity, and no water, and I was unsure as to what state the house was in from a structural perspective. What is normally a pleasant 15-20 minute drive took me nearly an hour, as the roads in some areas were impassable due to cracks, and the effects of liquefaction and rubble from the facades of buildings that had collapsed into the road. I called up the shift engineer on duty at the time, but he

was too busy to talk, although he did tell me that something had fallen off the top of the chimney stack; we did still have steam pressure, however.

Arriving at the hospital

By the time I arrived some of my team were already in attendance, and planning was well underway in prioritising the actions necessary to ensure we could keep the various sites operational. It was very much a team effort, with our medical colleagues and emergency planning teams all involved. Although still early in the morning, we managed to contact a number of structural engineers, since we still had hundreds of people in the buildings, and evacuation to the streets on a cold Christchurch morning for some very sick people would certainly not be an ideal option. We also enlisted the help of our site redevelopment team, who helped with surveying the buildings. A quick run around the older buildings that we knew had some pre-existing deficiencies revealed lots of issues, although none that would lead us to carry out a full evacuation of the main medical blocks. We dispatched teams to all of the hospital sites within Christchurch, and arranged for contact with the rural sites. It was fortuitous that the cell phone network kept working throughout this event - although it proved "busy" at times - as communication was the key to getting things sorted out.

Emergency power

At this time we were running all of the sites on emergency power, as all incoming electricity supplies were out of action. At Christchurch Hospital, in particular, we had just finished a capital replacement programme for some of the 11kV and low voltage switchgear, and had installed some new generation capacity, along with a new main switchboard on a major block of the hospital. This exercise had entailed meticulous planning over the preceding months to organise shutdowns, and had impacted on the various hospital departments every time we needed to undertake the work required to change circuits over. At the time this was very disruptive to the departments concerned, but, on a positive front, it later proved invaluable training for the earthquake event for the users, as all were well practised in knowing what was available from the emergency supply. We quickly checked the diesel storage capacities as, at this juncture, we did not know whether we would be able to secure deliveries; all of our underground fuel storage tanks were in good shape, and we had enough diesel on all sites for at least 40 hours' running on full load. We were subsequently able to contact the local lines company, which, despite having its hands full, went out of its way to ensure that we had supply back at all sites within a few hours.

Continuing after-shocks

We then assigned tasks to teams of two people each, as we did not wish anyone to be entering plant areas at the top of buildings or in basements on their own, since there were still strong after-shocks occurring regularly, sometimes within a minute of each other, and there was the potential for a lot of heavy machinery to move around unexpectedly. Boilers and chillers, air handlers, cooling towers, generators, transformers, main switch boards, and HV switches, were all checked methodically, and damage noted and prioritised. We discovered that two of the large chillers in a base-isolated plant room had effectively jumped off their seismic mounts, and were only being held in place by pipework. This was clearly a major priority, because without chilled water we could not provide cooling for the buildings, medical equipment, or computer rooms etc. The CDHB has a large fleet of lifts - mostly traction machines, but also some hydraulic. All had to be checked for safety before further use. With the number of high rise buildings on the estate this was a priority. Fortunately, most of the lift fleet had come through relatively unscathed, but there were a few lifts that had sustained more damage, and needed repair. The most serious faults we found on three of the lifts was that the counterweight had completely jumped out of the guide rails. As the counterweights weigh approximately 47% more than an empty lift car, this meant there was a large lump of steel hanging in the lift shaft uncontrolled, with a high possibility that it could hit the lift car if used.

Underground tunnel

An underground tunnel joins the Christchurch Hospital site to the St Asaph Street site. While this was primarily designed as a services route, and carries steam mains, HV and LV cabling, medical gas pipeline, and Lampson tubes, it has also been modified for pedestrian use. While we were fortunate that the tunnel itself had not suffered from liquefaction, water was now, however, entering it at various points, as cracks within the structure had occurred, and existing routes of groundwater heading for the river had now changed. Another area of concern at Christchurch Hospital was the boiler house, and its associated chimney stack. We are currently in the process or replacing the three existing coal-fired, fire tube boilers of 12 MW total capacity, and installing two 7 MW coal-fired, water tube boilers and one 7 MW diesel-fired, fire tube boiler. The chimney stack was erected in 1966, and is 55 metres high; the outer skin is of reinforced concrete construction, with an internal brick liner. Following a report in 2008, we were planning some seismic upgrading of the boiler house and chimney stack, and a contract had been let to a local building company to start some of this work in mid-September. There has been some damage to both the boiler house and the chimney stack, and we have had to make some hurried temporary repairs and bring forward certain aspects of the seismic upgrade.

Little rest for the team

In summary, after the events of 4 September many of our team did not have a lot of rest for an extended period of time; if we were not at work we were dealing with the aftermath at home, or at families' homes, or helping friends and neighbours. Much of the time, aftershocks were occurring. We had to be careful with staff, as it was clear that it was a very stressful time for all concerned, and continues to be so. We made sure that we got a roster going so that staff could take some time off, made use of contractors where possible, and put in place a

support mechanism for those that needed it. At the time of the event, and in the immediate aftermath, it is remarkable that training and adrenaline kicks in, while staff knew where to go, and what to do, and worked long hours without breaks with no thought to reward, or even to might be happening to their own properties, which, in some cases, were badly damaged, or even destroyed. All of this was to be repeated a few days later, when one of the after-shocks was close to the town and not very deep, as well as 5.1 in magnitude. This disrupted the recovery effort severely, and caused further damage to already stressed buildings, systems, and people.

Key learnings

I think it is fair to say that we are still learning and, while the after-shocks are continuing, we are still vigilant, and carrying out re-inspections of our entire estate, as necessary. There is an advantage in having on-site personnel experienced in the operational aspects of plant and equipment, who can react quickly to changing situations, and are aware of how the whole infrastructure hangs together, and what to prioritise. Close liaison with medical and nursing colleagues is also of the highest importance in identifying priorities, and what systems to bring on line first, as is liaison with external agencies such as civil defence, and power companies 1 suppliers etc. While having good, reliable plant such as back-up generation is a prerequisite, one thing we have learned is that, should an outage be prolonged, we would need to bring on line some of the non-essential, as well as essential, supplies. Although we could electrically feed all of the many items of major medical equipment, such as CT machines, linear accelerators etc, it became apparent that the cooling aspect would become a problem under certain conditions, and at certain times of the year; indeed without adequate cooling many of the systems could not operate fully.

Sizing of generation capacity

We had a plan to manage this load if need be, but, going forward, we shall be looking carefully at sizing of generation capacity to meet either full load, or a high percentage of it. This will give more flexibility, and cover off the risk of not being able to supply some of the non-emergency loads that would become more important as time elapsed. Regular inspection of pipework systems (especially steam mains), to ensure that the anchor points and expansion joints are in good order, has stood us in good stead; we have had minimal damage in these important areas. Our good relationships with suppliers and contractors /consultants meant that many people in the town were familiar with the layout of the sites, and we did not have to waste too much time escorting people around. We shall be having a de-briefing session soon, firstly with our own staff, and then as part of a wider CIDI-IB debrief. The team is already finding things that, with hindsight, we could have done better/more efficiently, and we shall highlight these and make sure that any key lessons are shared with our colleagues here in New Zealand. We are still in the early stages of recovery; parts of the city have been hit hard, while other parts have no perceivable damage. As for the healthcare buildings, although damage has been sustained, the final cost will not be known until we have finished surveying, which Is likely to take a month or so. Thankfully, however, we remain operational, and 'open for business", to serve the people of Canterbury.

We would like to thank Alan Bavis, Facilities and Engineering Manager, CDHB who gave us permission to print this article.

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Partners Conference Report

The Partner's Programme for the 2010 Conference in Auckland commenced on Thursday 4th November with a brisk walk down Albert Street to catch the 10 o'clock ferry to Waiheke.

The group of 14 women plus one very charming baby enjoyed a very pleasant day. Baby Sam proved to be an absolute delight – a dream baby who was a great hit with all the surrogate grannies and aunties.

At the wharf at Waiheke, a charming young man picked us up and transported us to Wild on Waiheke Vineyard. There we were divided into two teams and started our lessons in archery and laser clay shooting. Uncertainty prevailed at first, with initial arrows shooting way down the vineyard rather than hitting the target and clay pigeons proving to be very difficult to sight, let alone hit. However, it was soon apparent competitiveness would take over and joking and laughter gave way to serious frowns of concentration.

Team A was the eventual winner with the discovery of a very good clay shooter and another very good archer. The reward for all this activity was a very good lunch and wine tasting much enjoyed by all.

A quick visit to Azurro Olive Grove (disappointing to see only one Alpaca) was followed by a stop in Oneroa to explore the shops although one of us spent time wading in the waters of Oneroa. When the bus returned to pick us up we were joined by a couple who thought we were the local bus – after a VERY fast sightseeing trip we departed on the ferry back to Auckland. (The couple picked up probably wishing they had waited for the normal bus).

Friday morning arrived with misty rain as the group of 12 this time (plus baby of course) set off for Howick Village via the waterfront and Musick Point. Coffee for some and shopping for others at this stop, then it was on to the Historic Village. Although not "a working village" as it was a weekday visit, a very informative talk was given by the guide (in traditional old style clothing).
Lunch in the adjoining café was enjoyed by all and then it was off home with some intrepid shoppers being dropped at Newmarket to find their own way back.
All in all, a lovely couple of days of relaxation and good company.

Lyn Macdougall

Photo above :-
The ladies all set for Waiheke Island on the upper deck.

Photo left :-
Maria winning a bottle of bourbon, Max was highly delighted.

The Conference Partners group.:-

Front, (L to R) Karen Bright, Paula Roberts, Amanda O'Callaghan.

Middle, (L to R) Chris Duncan, Lyn MacDougall, Angie McKee, Judie Flower.

Back, (L to R) Monica Logan, Allison Blackler, Trish Moller, Pauline McCartney, Maria Christensen

Absent – Jeanette Carey – Smith, Chantelle van den Berg and Jo Wing.

Facilities Conference Report

by Graham Dudfield

One of the upsides of organising the NZIHE conference is knowing that the following year it will be someone else's job and that you will be able to enjoy the conference without any distractions or worries. So it was the case for Kevin Bardsley and myself this year.

The conference was held at the same venue Bill McDougall used last time he was organiser, the Crowne Plaza Hotel in downtown Auckland. Following a successful Domo Technica Biomed training day. The conference proper was opened by President McKee on Thursday morning.

The keynote speaker was Dr Robin Dunlop Chairman of the EARB. His main point was What is the future of the EARB? Is it still relevant? Can we promote it better? Robin sought feedback from the members.

The theme of the conference was "Getting more from less", and this point was well illustrated by visiting UK energy expert Graeme Robertson – Healthcare Solutions, Schneider Electric – with his paper "Energy Efficiency - How To Achieve It". Graeme provided us with examples of how an intelligent energy efficient hospital can bring benefits to patients and staff as well as the accountants.

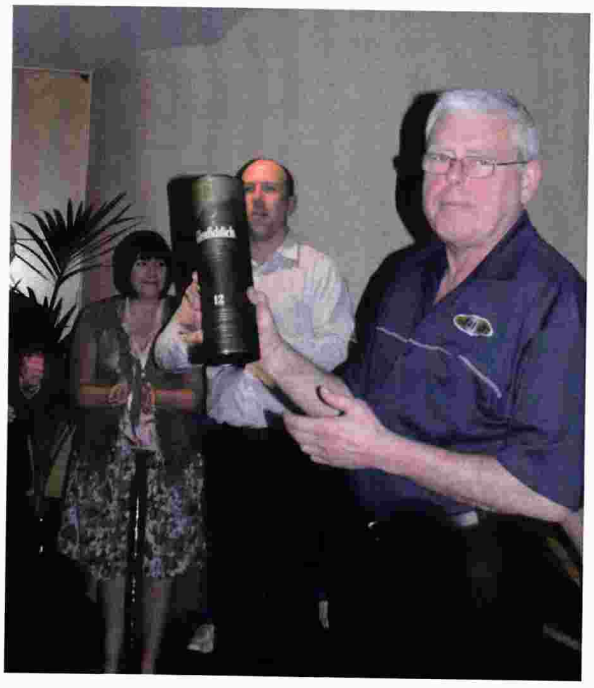
The BECA team of Richard Walsh, Ian Jackson, and Stuart Smith gave an insight to challenging established design practice to deliver better value.
One example they provided was a model they developed to calculate optimum energy savings by varying duct sizes. Larger duct sizes use less fan power but inversely have greater heat loss. They found an optimum size in a Middlemore Hospital project was around 30% larger than would be normally used in a standard design.

Jim Moody – Hastie Group – gave a paper on the future of medical gas pipeline systems. The use of VSD's on vacuum systems will become more common and alarm systems connected to the BMS and internet will alert our mad gas suppliers when we are running low.

Jon Mortensen spoke on the future of asset management software. Although systems have been around for 40 years now, software has evolved dependant on hardware and imagination. The future will be an intelligent system which will solve the problem of "The Elephant in the room."

The site visit was to Schneider Electrics "State of the art" building at Highbrook. This building demonstrated what could be achieved with technology and careful planning. For most of us it was like being let loose in a candy store. I'm sure we all came away with many useful ideas and plans – now to convince the accountants.

Trade Night had some 37 stands – something for everyone – and was very well attended. I can't remember who won the single malt whiskey prize but Bill was overheard to say "what a waste."



The bottle of Glenfiddich that got away from Bill!!

Stuart Smith gave us an update on his recent trip to the IHEEM international conference in Manchester. With several conference streams running he had some difficulty deciding which papers to attend – but his synopsis of the papers was well received and it is good that he could share the experience with us.

David Strong gave us an over view on the Shared services establishment board – or Health Benefits Ltd as they are now known. Charged with finding $700M in savings we all waited with baited breath to hear what was happening with Facilities, but all he could tell us was nothing yet but it is on the agenda. I'm picking he needs to talk to us again next year.

Warren Crawley presented a very good paper on the challenges he had in building a new medical records building at Palmerston North, which incorporated several energy efficient features. Well done all the members who presented papers this year.
Kevin and I spent some time with the ANZEX delegate – Michael Della Franca before the Conference and it quickly became apparent that he had a passion for energy management and energy efficiency. His paper "You cannot manage what you cannot measure" was excellent and covered a full range of technical "Tricks" - for want of a better word, on how to manage energy usage in a large healthcare facility. One example among many, was how to tweak the BMS setting to reduce chiller loads.

The paper by Isla Nixon on radiation technology was of particular interest to me, as I have a project to assist with the replacement of an aging Linac machine. Isla's paper outlined the advancements made in radiation therapy over the years.

Midllemore Biomed Edwin van der Klis gave us an interesting paper on risk assessment and how they formulated their own method out of necessity at a UK hospital.

Doug Moller spoke to us about his experience as ANZEX delegate at Perth. I always look forward to these "debriefs" and seeing how they do things across the ditch. Interesting to see a Biomed's perspective of the various sites he visited.

Warren Crawley presenting his paper

Nigel Wing gave us an excellent debrief on how the Christchurch hospitals coped with the earthquake. Very well by all accounts and testament to his team at Christchurch. A few interesting CCTV clips – notable that all emergency power systems started faultlessly on queue. One comment Nigel made was that his best asset in the emergency was the wealth of knowledge his team possesses – a point he made sure he got across to the Minister on his visit to the sites. Nigel still has a lot of work ahead and there is still those damm aftershocks – 2500 at last count.

While all this was going on - the partners went overseas to Waiheke Island where amongst other activities they tried out archery and shooting. Some good shots among them by all account.

Well done Bill on another successful conference. You can sit back and relax next year. We meet again in Christchurch next year. Hope those aftershocks have finished by then.

Biomed Conference Report

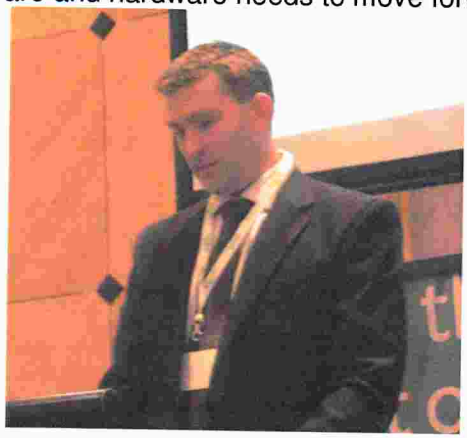
From Dew Saly Thankachan
Trainee BMET, ADHB.

The 65th NZIHE Conference was held in Auckland on 4th and 5th of November 2010. It was a very well organized and well attended conference. Representatives of government and private institutions were present from New Zealand and abroad. As a beginner in this field, it was a great opportunity for me to meet these people and learn about the latest developments in the healthcare sector. Many papers were discussed for both the facilities and biomedical stream.

On the first day of conference, the main topic discussed was how to achieve energy efficiency in hospitals. It was regarding the different energy efficiency methods and models that can be implemented in hospitals. The trialed presentation was designing, creating and assessing energy efficiency and resilience in healthcare facilities by the team from BECA.

Stuart Smith, Ian Jackson and Richard Walsh from BECA

Another topic discussed was 'The future of medical gas pipelines' by Jim Moody. This paper covered the installation of vacuum systems using VSD controls, smoke evacuation systems based on the upcoming international standard and safety concerns, tourniquet control systems, theatre gas control and alarms and interfacing with the hospital intranet.
Last paper on day one was the 'Future directions in asset management software' by John F. Mortensen. This presentation was about the evolution of the asset management concept using software. In this presentation he mentioned that the efficient way of asset management using software is possible. To achieve this goal the relationship between software and hardware needs to move forward.



John F. Mortensen discussing management software.

Afternoon section on the first day was a site visit to Schneider Electric; a building showcasing an impressive range of leading edge features in sustainability and energy efficiency. By the end of this tour we understood how they use technology to build an energy efficient building. They also explained how they distribute energy and how they manage it using software.

On the second day of our conference, biomedical and facilities streams had different sections in the morning. The first topic in the biomedical stream was presented by Douglas Blomfield and Murray John from Auckland DHB. They covered the selection of a computerized maintenance management system and the successful implementation of that system in Clinical Engineering. They also discussed the steps, issues, challenges, and lessons that CE management have coped with during the implementation of INFOR EAM.

Andries van den Berg's presentation was about the surgical instrumentation repair resources for NZ. He pointed out identification problems on more than 60,000 instrument types available in the market and the helpful suppliers used by

ADHB. He also mentioned the resource repair manuals and sample PDF's available for repair technicians. In the next section Tony Blackler gave the standards updates in AS/NZS3551, AS/NZS3003, AS/NZS3003.1, AS/NZS 2500 and AS/NZS3760. Then Edwin van der Klis shared the thought of saving money without causing undue risk to patients especially when there is a shortage of staff compared to the numbers of equipment to be deal with.

In the combined section of day two, Isla Nixon pointed out how engineering advances have influenced radiation therapy delivery and outcomes.

In conclusion, this conference was a platform where we discussed about new ideas, implementation of new ideas and the results from some of these projects. In this way this conference was very informative and interesting. I really enjoyed the conference and definitely will plan to attend them in the future.

Isla Nixon, Principal Physicist, Radiation Oncology ADHB.

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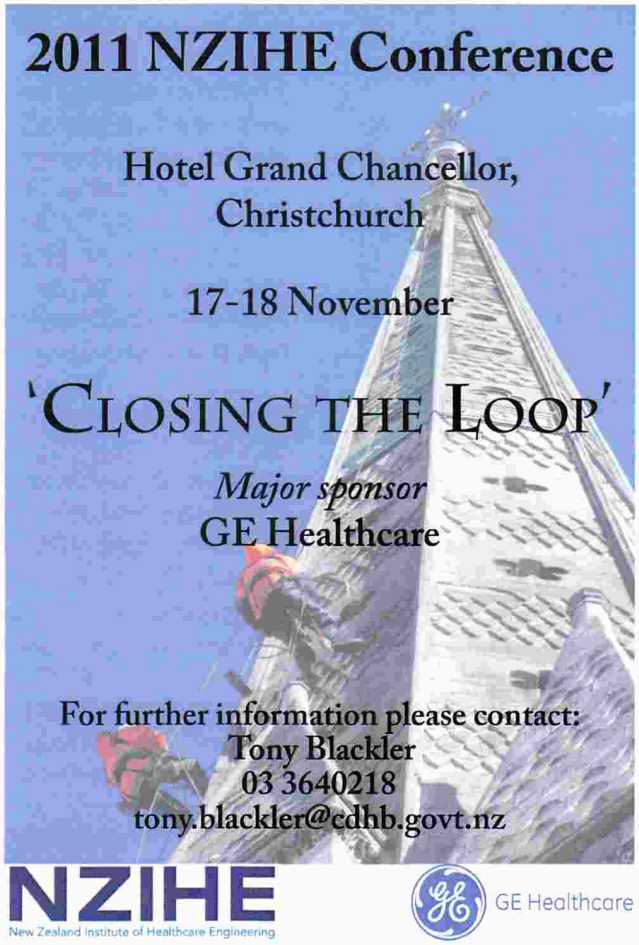


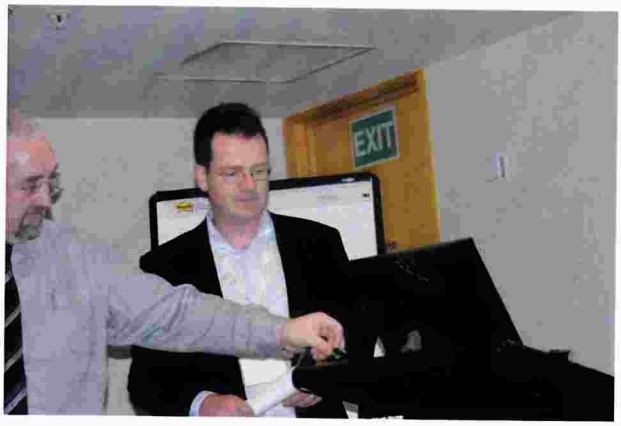
Australian Anzex delegate, Michael Della Franca and Nigel Wing relaxing together.

Keynote speaker Dr. Robin Dunlop being presented with a thank you bottle of wine from Tony Blackler. Michael Della Franca about to photograph them.

Jon F Mortensen being thanked by Richard Whitehead for his presentation about Asset Management Software.

The Aquatherm stand with a large display of underfloor heating.

The Schneider Electric stand was always busy. They made a massive contribution to the conference.



Stuart Smith of BECA having a computer glitch sorted before giving an update on the recent IHEEM Healthcare Estates Conference in Manchester