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# THE HEALTH ENGINEER



THE JOURNAL OF  
N.Z. INSTITUTE OF HEALTH ESTATE AND  
ENGINEERING MANAGEMENT

# THE HEALTH ENGINEER

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

Volume 2 No 9 Summer 2003

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Inner back cover - Final draft of the NZIHEEM ENGINEER/ BIOMED OF THE YEAR sponsored by BOC.	

Cover Photograph :- The view from the top of the new Auckland  
Hospital building looking towards the central business district.

The health and viability of any organisation 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.

# Hugh Elder

## Life Member NZIHEEM

Hugh started his Engineering Career with New Zealand Rail as a Cadet Engineer. He went to Canterbury University where he graduated in 1953 with a Bachelor of Engineering.

Although Hugh's BE was in Electrical Engineering the Mechanical side of NZR was the dominant part of Engineering and Hugh was answerable to the Mechanical Engineer, this led to him being sent to London in NZ Government Offices on inspection of contracts for NZR controlling a group of Inspecting Engineers.

Whilst in London he met and married Marion and they returned to New Zealand in 1957, Hugh completed his bonded time with NZR and moved to Wellington Municipal Electricity Department in 1959 and stayed there, as Design Engineer, until 1963.

In 1963 Hugh moved into the Building Services field with Kofoed Arnold & Partners. Around this time he was accepted as a Member of the Institute of Mechanical Engineers. For the next 6 years he was working with all the aspects of Building Services.

1969 saw the Elder's move to Auckland with Hugh joining Stephenson & Turners as Senior Engineer, this position brought him into contact with hospitals, working on the Otago Hospital and Auckland Medical School. After 2 years with S&T Hugh moved to Beca Carter Hollingsworth & Ferner where he was the Air Conditioning Engineer. Hugh became involved with the Pulp & Paper industry and motor car manufacturing being responsible for air conditioning and ventilation standards. He also started with energy conservation and acoustic work whilst in this position.

Auckland Hospital Board was Hugh's next employer, when he joined them in 1980 as Energy

Engineer. In those days the AHB managed all the major hospitals in Auckland with the Board's area extending from Wellsford in the north to Mercer in the south, therefore the AHB were a major energy user. This is where I first met Hugh as he started gathering the information on what energy Auckland Hospital was using. One of Hugh's first successes was in lowering the water consumption at Middlemore Hospital. While not actually reducing the use he found one of the reasons for the high water accounts, were due to the local authority feeding one of the housing areas through the hospital mains and not crediting the outflow meter.

Hugh also assisted other Hospital Boards outside Auckland with Energy saving.

By 1985 it was time for a change again, but this time it was with the same employer, Hugh became the Board's Mechanical Engineer and stayed in this position until he took early retirement in 1992. During this time Hugh was an active member of the Hospital Engineers Association, being on the executive for a number of years, reaching the position of Vice President.

Hugh continued to work after leaving Auckland Area Health Board as a private consultant working on many projects and maintaining his association with NZIHEEM. He finally retired in 2000 and is now living quietly with Marion in their Kohimarima home, unfortunately Hugh has had deteriorating eye sight and has to use a magnifying glass to read the paper.

Hugh still possesses his dry sense of humour and is enjoying life in his retirement.

**Hugh was proposed and accepted as a Life Member of the Institute in 2001.**

Bob Duncan

Continued from page 5

access to improved decontamination facilities. The private sector has undertaken to adopt the same standards as the NHS. The Department of Health has set up a series of information exchange meetings to which the independent healthcare sector, the Ministry of Defence and the Prison Health Service are all invited to discuss progress.

**Future programme**

The decontamination programme has delivered significant improvements in decontamination standards across the NHS. The Government is taking action to ensure that this rate of improvement is maintained into the future, and improvements in knowledge techniques are incorporated into NHS practice. The NHS will build on achievements to take the overall standard across the NHS even higher.

- NHS Estates is continuing to support NHS Trusts in improving decontamination standards through training, guidance and advice.
- Continued its close working with many professional organisations including :-  
 Commission for Health Improvement  
 Institute of Healthcare Engineering and Estate Management  
 Royal College of Anaesthetists  
 Royal College of Ophthalmologists  
 Royal College of Pathologists  
 Royal College of Surgeons  
 British Association of Orthopaedic Surgeons  
 British Association of Oral and Maxillofacial Surgeons  
 Society of British Neurosurgeons  
 British Association of Otorhinolaryngologists.

Several of the above have placed supporting information on their websites. For example: "The Royal College of Surgeons welcomes the improvements in decontamination across the NHS and the very necessary upgrading of Sterile Supply Services.

"The Royal College supports the high priority being given to this need" - Mr Charles Collins on behalf of the Royal College of Surgeons.

- Work has begun to assess and improve decontamination standards in primary care.
- The development of a National Training Scheme to improve training arrangements for healthcare professionals and an approved process for decontamination facilities is under way.
- NHS Estates is reviewing the current arrangements with respect to the level of professional and technical support available to NHS hospitals on decontamination.

The modernisation of NHS decontamination services is a long-term process not a one-off event, and the NHS will continue to ensure that appropriate precautions based on evidence and scientific advice, are taken to ensure patient safety.

**NZIHEEM members please note the following dates of significance :-**

**Regional Meetings.**

Northern North Island - **Thursday 20th March 2003**, at Waikato Hospital

Southern North Island - **Wednesday 12th March 2003**, at Palmerston North Hospital.

Northern South Island and Nelson- **Saturday 22nd March 2003** at Nelson

Executive Committee Meeting -**Wednesday 2nd April 2003** at Wellington

**Annual Conference** - Thursday 6th and Friday 7th November 2003  
 at the Grand Chancellor Hotel, Christchurch.

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## The New Zealand Institute of Health Estate and Engineering Management

Report on the 57th Annual Conference  
held at The Carlton Hotel, Auckland on the 7th and 8th November 2002

### The major sponsors for the conference were :-

- BECA Carter Hollings and Ferner Ltd.
- CASS Medical
- Fisher and Paykel Healthcare
- CleanTech Services Ltd

### The Trades exhibitors were:

- Alaris Medical Systems
- Aquatherm NZ Ltd
- Austco Communications
- Camfil Farr NZ Ltd.
- Chivaune Consultants
- Chubb Systems
- Delta Valves and Controls
- Domo Technica
- East Harbour Management Services/MD Projects Ltd
- Fresenius Medical Care
- Gough Technology
- Honeywell
- Infinity Solutions
- Intermed Medical
- Mercer Medisys Ltd
- Mercury Computer Systems
- Meritec Ltd.
- MedXus
- Philips Medical Systems
- REM Systems
- Siemens NZ Ltd
- Sinclair Knight Merz Ltd
- Saint Croix Systems
- Tyco
- Welch Allyn

Mercer Medisys and Honeywell sponsored drinks and food respectively for the Trade Night and BOC Gases sponsored drinks at the Friday evening Annual Dinner.

My thanks to all the companies who participated and supported our conference with particular thanks to our four major sponsors. This was the first of (I hope) many joint Facilities/Biomed conferences with generic papers on the first day and a separate Biomed and Facilities stream on Day 2.

Dr Nigel Murray, General Manager of the Auckland District Health Service Delivery Plan, opened the conference. The focus of Nigel's address mirrored our conference theme as the watchwords of HSDP - consolidation, integration, standardization fit very well with a sustainable and holistic approach to healthcare support.

Dr Rodger Spiller, Executive Director of the NZ Business Council for Sustainable Developments, was our guest speaker and really set the tone of the conference with a high level overview of Government and organizations approach to sustainability. The message came through loud and clear that by taking environmental concerns into account, not only sustainability of product (and therefore business) can be achieved but that there are significant cost benefits to be realized also.

Then followed papers from the Australian ANZEX representative Brian Cork, *The Fifty Year Building* - Klein Healthcare and Kevin Bardsley, the New Zealand ANZEX delegate.

The enthusiasm generated by Richard Morley - Hall in the *Warehouse Sustainability Journey* was infectious and the humorous and sometimes whimsical approach taken by Peter Davies in his paper *Selling the back-office service function* led on nicely to the last paper of the day.

The first day papers were completed with John Coonies' extremely entertaining but nevertheless thought provoking "*How to realize your wildest dreams - without losing your marbles*".

I don't think there was a parent in the room who did not identify with "**The Lecture**" - a 5-minute monologue on the trials and tribulations (and joy) of sharing space with teenage children. I know I did. Despite the amusing and excellent delivery there was an important message for us all in that if we are not enjoying what we are doing and are not passionate about doing it then we can't sustain it in the long run.

The AGM was held at 4pm and duly completed in

time for delegates to assemble for the trade's exhibition evening.

In all, more than 90 delegates, partners and invited guests attended the Trade Night with the opportunity to view the latest and greatest from the main players in the Facilities and Biomed Medical industry. Including our major sponsors and event sponsors there was 12 Facilities, 14 Biomed and 4 maintenance software companies represented. Plenty of food and drink, trade stands to visit, new products to see and business contacts to develop. Does life get better !!

On Friday morning, everyone was fit and keen, (except for those who missed the bus) for the site visit to the new Auckland City Hospital. My thanks to Fletcher Construction for providing morning tea and tour guides to take the groups through the building.

Back to the Carlton Hotel for a split stream day of papers.

In the facilities stream one of our major sponsors, BECA presented papers on *Introduction to Building Services of Auckland City Hospital and Operating Theatre smoke extraction*. It was a pity, the second paper on Smoke Extraction could not have been incorporated into Day 1 as it was applicable and of interest to the Biomed group also. Unfortunately this could not be fitted in with the time scale and papers content received.

The Facilities' afternoon session continued with a lively paper from Wayne Brown - Industry NZ, and papers from Richard Brand titled *Fire Engineering in Hospitals* and *Progression of Control Systems* from Mercer Medisys.

Meritec completed the day with *Pareto's Law & its relevance to trends in Hospital Engineering Design*.

Meanwhile, on the Biomed side of the conference, we were also being treated to an abundance of excellent papers.

We started with our two major Biomed sponsors. I had never truly appreciated the critical nature of respiratory humidification until hearing the paper from Annelise La Roche from Fisher and Paykel. I'll never look at a humidifier in quite the same light again !

Mark Darin from Cass Medical then opened up a whole new horizon and possibilities with his paper

on the future of networked physiological monitoring.

The quality of the papers continued in the afternoon with papers on medical equipment management software from Mercury Computers and Saint Croix. Interesting the different approaches taken.

My thanks to Alaris Medical for providing, at short notice, a well-presented and received paper on the future of infusion pump technology.

Kevin Flower must be congratulated, as the only NZIHEEM member willing to present a paper, for his delivery on *Communication and Promotional Speaking*. Perhaps we should all take heed of Kevin's advice so that more members will feel comfortable about presenting papers in the future.

After two fairly "full on" days, the annual dinner aboard the MV Osprey was a time to relax, unwind (dance) and enjoy each other's company whilst cruising through the America's Cup Village and surrounding Hauraki Gulf. The weather was kind to us. Well it would be, wouldn't it - this is Auckland after all !! - Not too many upset stomachs and after a few drinks everyone seemed to get their "Sea Legs".

High points of the Conference for me - The last week or so when the registration forms really started to roll in and the Thursday morning as the delegates arrived.

Low point of the Conference for me - Running short of food at Friday Lunch. I just don't know where all the people came from but we certainly had about 20 more attendees on Friday than Thursday. Perhaps the word was being spread about the quality of the papers presented.

In conclusion it's been an interesting experience for the organizers and, I sincerely hope, a worthwhile and beneficial time for sponsors, trade exhibitors and delegates alike.

I'm sure I wasn't as grey as this at the start of the exercise !!

My thanks to Kieran Davis and his wife Anne-Marie for their help and a particular very big Thank You to my wife, Lyn, without whose considerable work this conference would never have got off the ground.

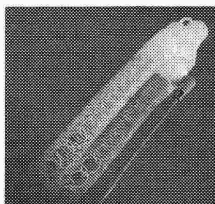
Hope to see you all in Christchurch in November.

Bill MacDougall

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## Conference Partner's Programme

It was great to catch up again with old friends and meet some new ones also at this year's conference. There was good representation from all around New Zealand from Auckland to as far south as Dunedin. Wendy from Hawkes Bay, Alison and Kaylene from Christchurch, Maria from Wellington, Judie from Taranaki, Sharon from BOP, Monica from Levin, Pauline from Masterton, Patsy from Greymouth, Noeline from Rotorua, myself and Anne-Marie from Auckland and our most southerly visitor Patricia, from Dunedin.

I suppose the only disappointment is that Auckland was the most northerly area represented

### Thursday 7th November

A nice fine day saw us all up bright and early as we were to be picked up from the Carlton Hotel at 9.30am. First stop was Dress Mart with over 70 factory outlets under one roof and prices up to 70% off normal retail.

How can bargains like that be passed over with shops such as Barkers, Esprit, Glassons, Jacqui E, Just Jeans, Modern Bags, Orotan, and Stevens Home and Giving. With such a diversity of shops to choose from, we split up and went "Bargain Hunting".

Some people with stamina searched out really good buys whilst others, having got a few things sat and gossiped over a coffee. At noon we all met up and there was great enjoyment comparing successful buys and then we were off to the Viaduct. A relaxing lunch at the Grill recharged the batteries before investigating the area around the America's Cup Village and inevitably drifting over to Victoria Market - more shopping !!

In the evening, it was a great opportunity to visit the trade stands and see some of the equipment you guys work with, not to mention enjoying the excellent catering sponsored by Mercer Medysis and Honeywell.

### Friday 8th November

Another fine day lay ahead as we set off for a scenic drive to the Waitakere Ranges. Our first stop was Arataki, a beautiful and fascinating area, steeped as it is, in Maori history. The original plan had been to make a brief stop but such was the interest that we spent longer there than anticipated.

Our next stop was meant to be Piha on the West Coast. However, the driver was not familiar with the route, took a wrong turn and the unanimous decision was made to abandon the idea and head for the Crystal Mountain. Lunch was enjoyed at Café on the Rocks at Crystal Mountain. The gallery there, houses New Zealand's largest

selection of crystals and minerals from around the world. With so much to see in the museum and an amethyst cave to be explored, we decided to stay there rather than push on to the Twin Lakes Country Garden, which had been our next port of call.



Photo - The Partners Group framed in the Waitakeres

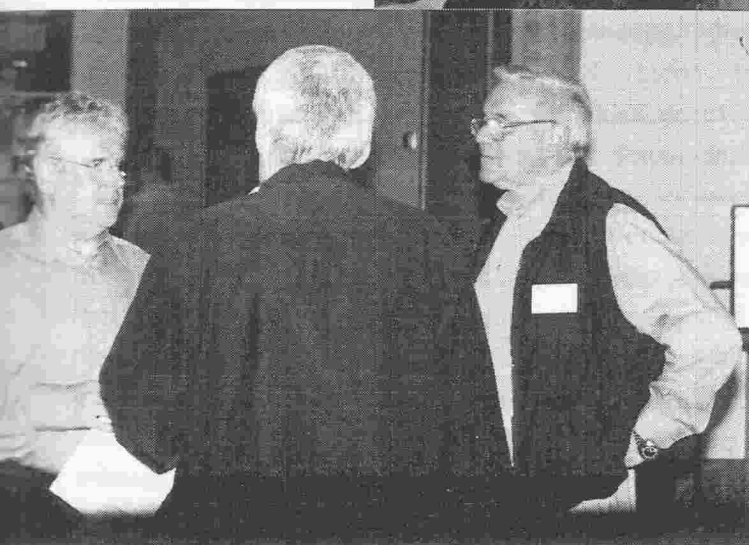
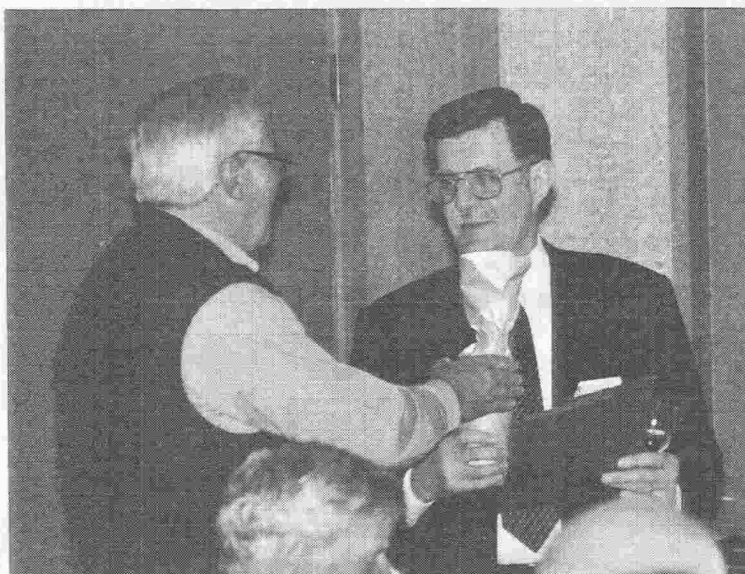
We returned around 3pm, in time to get ready for the annual conference cruise / dinner aboard the MV Osprey. Some of us even managed to squeeze in a quick swim in the Carlton pool. With so much to see and so little time, we missed a number of sightseeing visits scheduled on the programme such as the Silverdale shops, Twin Lakes Country Garden, Kelly Tarlton's and the Museum. I guess you will all just have to come back next time conference is in Auckland and we can pick up where we left off.

Great to see you all and looking forward to seeing you at Christchurch.

Lyn



Conference Photorama



Photos - Clockwise from top left

- 1) Tom Sawyer presenting Brian Cork with some trans - Tasman spirit.
- 2) Stephen Derig on the Aquatherm display.
- 3) A happy corner in the cabin of the Osprey during the Annual Dinner cruise round the Waitemata Harbour. Judy and Kevin Flower, Marie Christensen at the front and Lyn MacDougall, keiran Davis, Allison Blackler, Pauline McCarthy and Max Christensen standing.
- 4) Bob Duncan, Ron Thomas (back to camera) and Tom Sawyer in deep discussion

The following Paper was presented at the 57th Conference of the Institute in Auckland, November 2002 by the co-author Hamish Tait

# Operating Theatre Smoke Evacuation

**Authors: Hamish Tait, Phillip Gillon - Beca Carter Hollings and Ferner Ltd.  
Bruce Lill - Canterbury District Health Board**

## Abstract

During surgical procedures that use laser or electrosurgical equipment, the thermal destruction of tissue creates a smoke by-product. The contents of surgical plumes are similar to other smoke plumes including toxic gases, respirable particles containing carcinogens and harmful aerosols. Patients and operating room staff alike are subject to the health risks associated with the smoke, unless suitable measures are taken to evacuate the smoke from the operating site.

Traditionally, local self-contained evacuation systems have been recommended to deal with surgical smoke, however the effectiveness of an 'in room' filtration system is questionable. Although the air passes through high-grade filters, the air is returned to the space, still containing traces of the fumes and odours. The use of a Centralised Smoke Evacuation System provides an alternative solution eliminating all extracted smoke, via filters, to the outside environment. This provides a safer operating environment for both the surgical team and the patient.

## I Introduction

This paper firstly outlines the health issues that are associated with the smoke produced by medical laser and electrosurgery equipment. By understanding what harmful substances are contained within surgical smoke plumes, the need for extraction of fumes is reinforced. An outline of the current approach to dealing with smoke plumes is then discussed, highlighting shortcomings and ways in which the procedure could be improved. The use of Centralised Smoke Evacuation Equipment is introduced and the major benefits over 'in-room' smoke filtration illustrated. A description of the components of a Centralised Smoke Evacuation Unit is followed by a comparison of the economic costs between portable and central evacuation systems.

For those familiar with Anaesthetic Gas Scavenging Systems (AGSS) or dental suction systems, the equipment currently used for smoke evacuation is similar. The technology is similar to that of a 'domestic vacuum cleaner', which provides a high volume flow with only a small negative pressure differential.

## 2 The Health Effects of Surgical Smoke

An increased awareness has developed of the health problems associated with human exposure to surgical smoke plume. The effects are equally applicable to the patient and surgical staff. Obstruction of view due to smoke is the first recognisable problem in the operating room. Secondly the odours generated by vaporised body tissue are both unpleasant and irritating. It should be noted that not all harmful gases have a distinguishable odour. The emissions within the smoke plume combine to irritate the eyes, nose and lungs and cause nausea. Studies indicate that as well as these short term inconveniences, the long term health effects of smoke plume must be addressed.

The particular harmful emissions that need consideration can be categorised into three groups:-

- Harmful aerosols - The particular aspects of concern are the transportation of human viruses. Examples are HPV, Jacob-Creutzfeld, Hepatitis B and C. Carbonised particles and intact cells

may be transported and without adequate extraction and filtration, concentrations are at a level likely to cause long term health problems to surgery personnel.

- **Toxic gases** - Gases such as Ammonia, Hydrogen Cyanide and Benzene are formed during laser and electrosurgical operations.
- **Respirable particles** - Particles ranging in size from  $0.05\mu\text{m}$  to  $10\mu\text{m}$  are contained within the smoke plume. These particles are within the respirable size range and can cause respiratory effects and damage when inhaled. Particles have been shown to be carcinogenic, with properties similar to those of cigarette smoke.

Particular hazards to the patient from improper extraction and filtration of smoke plume include the danger of smoke within a patient operating cavity. A study by Mercer University (Georgia, USA) found that concentrations of methemoglobin were increased when smoke was produced within the abdomen. Increased levels of methemoglobin lead to reduced oxygen carrying capacity by red blood cells, providing a threat to the patient and prolonging post operative recovery.



Hamish Tait

arrangements were used to blow or suck smoke away from the operating site, often to a nearby window. Deep bed charcoal filters, cardboard and paper filters were also used, but were often noisy and provided little bacterial and particulate filtration. The safety of these devices during cleaning and maintenance was also doubtful as the internal workings of the system were often contaminated. As the technology has progressed, more efficient portable devices with better filtration capabilities have been developed.

In general, the portable smoke evacuation units consist of a disposable hose connected to the unit. Extract air is sucked through the disposable hose by a fan with variable speed settings. The air then passes through one or more filters. A prefilter traps larger particles such as cotton or fluids accidentally sucked into the air stream. The type of main filters used are High Efficiency Particulate Air (HEPA) or Ultra Low Penetration Air (LLPA) filters. Activated charcoal filters may also be used, primarily for the adsorption of vapours and odours.

A number of problems exist with portable units. The filters need replacing after each operation.

Although the filters are easy to change, being single integral units, the exercise is costly and a major downside to the portable type smoke evacuators. The units are noisy, adding to an already noisy theatre environment. The biggest issue surrounding portable units is the resulting air quality. Although the filters used are highly efficient (e.g. a HEPA filter may be rated 99.97% efficient at  $0.3\mu\text{m}$  particle size), not all particles and odours will be removed, particularly when the filters become dirty. The filtered air is recirculated back into the theatre.

Another issue to consider with the smoke evacuation equipment, is the effect of general theatre air supply and extraction. Typically the air supplied is from a ceiling diffuser above the operating theatre table. Air passes down over the patient to a low level where it is

### 3 Current and Historical Techniques for Smoke Evacuation

In most New Zealand hospitals, three methods are employed for managing operating theatre smoke. Portable smoke evacuators are used in theatres where electrosurgical and laser equipment are working. The theatre is equipped with an air conditioning and filtering system. Staff and patients are also equipped with protective masks.

Historically, modified vacuum cleaner type

Continued from page 17

extracted. This aims to minimise air contaminants and provide a sterile environment near the operating site. The effectiveness of localised smoke extract systems could be affected by the movement of air within the theatre hence consideration needs to be given to the location and type of intake. The relative distance of the intake from the operating site is important. A compromise has to be made between achieving maximum possible extraction without being too close to the operating site affecting the surgeon's access and potentially engaging patient body tissues.

The final preventative measure undertaken by surgical teams is the wearing of surgical masks. Primarily this was undertaken to prevent expired droplets from surgical staff reaching the patient. The masks have been developed to also provide the user with protection from the air particles being breathed. Clearly the mask is only useful to the wearer if it has a secure fit. This is the primary problem with masks along with the fact that with perspiration the accumulated moisture in the mask reduces the filtration capacity.

## 4 Central Smoke Evacuation Equipment

### 4.1 Description of system

Two US companies have provided details on their Centralised Smoke Evacuation Systems. The systems are similar and are designed to operate as follows :-

Smoke is evacuated away from the operating room through disposable extension tubing from the surgical site to an inlet on an Operating Room pendant. It then passes through tubing within a ceiling mounted surgical support arm to ducting and into a centralised filtration / separation system. The multi-room evacuation system is designed to provide suction to one room at a time or to all connected rooms, as required. *Figure 4.1* illustrates an example of a typical layout of a centralised evacuation system.

Of the Systems studied, one provided filtration at the pendant, while the other removed the need for

'in-room' filtration with the use of disinfectant.

Fortnightly system disinfection is undertaken with debris removed to a sanitary waste system. A centrifugal separator removes particulate from the air before finally passing through an environmental filter prior to being discharged to atmosphere.

### 4.2 Benefits of a Central Evacuation System

The major benefit of the Central Evacuation System over conventional 'in-room' filtering Systems is that it evacuates laser and electrosurgical smoke and airborne contaminants and does not re-circulate any captured air back into the room. The units are quieter, having the extraction fan located remote from the operating room. Control of the extractor unit in individual operating rooms is via a manually operated switch on the pendant. Suction can also be initiated by coordination with switching on the surgical equipment.

### 4.3 Economic Comparison with Conventional Filtration

*Figure 4.3* compares the cost of a Centralised Smoke Evacuation System with an 'in-room' filtration module over a 15 year period. Though the initial capital outlay is three times that of the in-room modules, the equipment cost is recovered within two years through savings in annual disposables.

## 5 Where to from here?

- As Engineers, Asset Managers and Consultants, we can make ourselves aware of the activities involved in the creation and removal of surgical smoke plumes - Surgical smoke may be a greater health hazard than waste anaesthetic gases for which well recognised removal systems are provided.

Be prepared to raise the issue of installing systems when facilities are being designed or redeveloped where surgical smoke will be generated. This includes theatre blocks or specialised laser treatment rooms. Even in the case of small

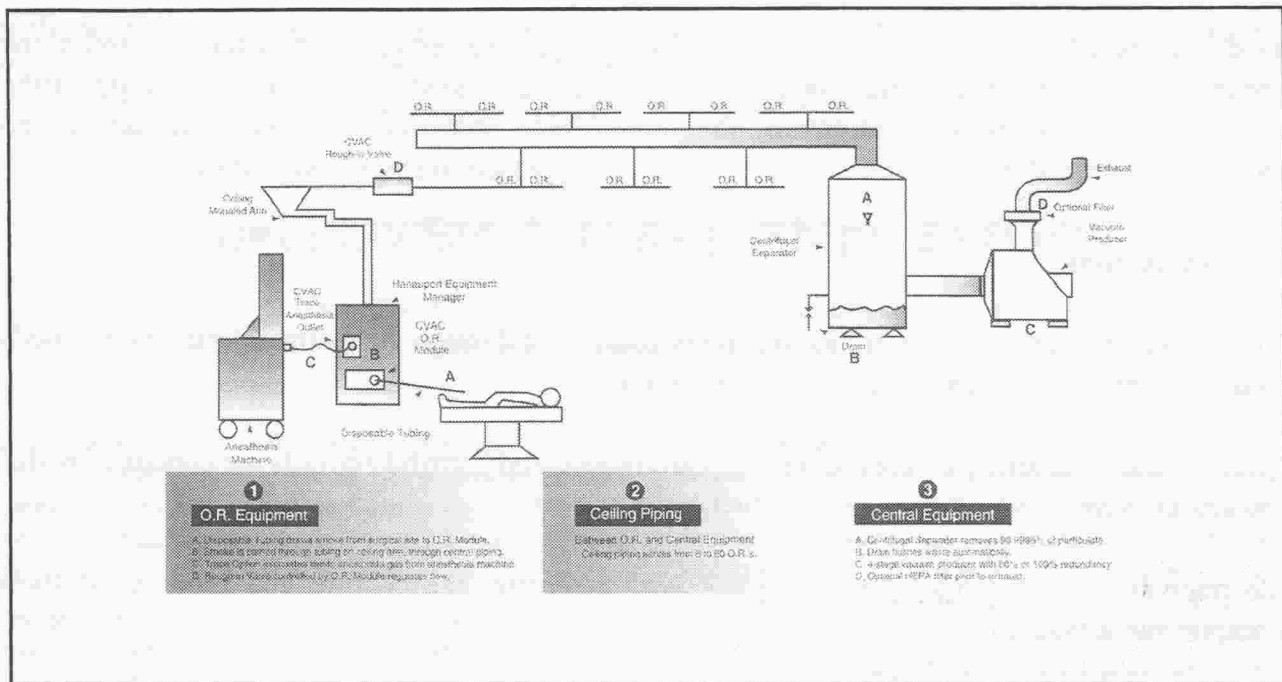


Figure 4.1. Typical Layout of a Centralised Evacuation System (Courtesy of Heraeus Medical)

Item Description	Number	
Operating Rooms	7	
No. of Procedures / day	5	
Minutes used per Procedure	15	
Project lifetime — years	15	
Capital Purchase	Cost Portable Unit	Cost Central System
Equipment	\$21,000	\$47,100
Piping and Installation		\$17,500
<b>Total initial cost</b>	<b>\$21,000</b>	<b>\$64,600</b>
<b>Filter &amp; Prefilter Costs</b>		
Filters/ Prefilters	\$8.15	\$0.00
Disinfectant	\$0.00	\$0.19
<b>Total Per-Procedure Cost</b>	<b>\$8.15</b>	<b>\$0.19</b>
<b>Total Annual Disposables Cost per OR</b>	<b>\$10,188</b>	<b>\$241</b>
<b>Total Annual Disposables Cost, all OR's</b>	<b>\$71,313</b>	<b>\$1,686</b>
<b>Total Project Lifetime Cost, Filters plus Capital (US dollars)</b>	<b>\$ 1,090,688</b>	<b>\$89,888</b>

Table 4.3 Cost Comparison between Central and In-room Evacuation Systems (US dollars)

Continued from page 19

groupings of rooms or a single room, there are obvious advantages in removing the evacuator from within the room.

- Appraise requests for in room, stand alone portable systems as the ongoing operating costs may easily justify a centralised approach to smoke evacuation.

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## **6 Conclusions**

- The smoke produced by laser or electrosurgery equipment through the thermal destruction of body tissue is harmful to patients and surgical personnel.
- Toxic gases, respirable particles containing carcinogens and harmful aerosols are contained within the smoke plume.
- To maintain a safe working environment within theatre, the capture and removal of these components is vital.
- Traditional extraction methods have improved operating conditions, however the recirculation of filtered air combined with the efficiency of the filters means that not all smoke particulate is removed.
- A safer operating environment would be achieved during surgery if a comprehensive system is used to collect control and dispose of smoke and airborne debris during surgical activity.
- Although the initial capital outlay is higher in establishing a centralised plant, the savings in terms of operating costs mean that a centralised system is viable within a short time frame.

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## **8 Acknowledgements**

- Mr Bruce Lill - R.E.A. Technical Supervisor, Technical Services, Canterbury D.H.B.  
A/Prof Philip Bagshaw - General Surgeon Canterbury D.H.B.  
B.Sc(Hons), LRCP, MRCS(Eng), MB, BS, FRCS~ng, FRACS.

## NZ Standards Activity

### Electromedical Coordinating Committee

The six monthly meeting of the EMECC, which is an integral part of Standards NZ management processes, was held in November. Three topics took up a significant portion of the meeting.

- The proposal by Medsafe to launch a register of products this year was discussed and some significant concern expressed that the proposed system had no basis for validation of a product before it was entered on to the database. The committee expressed their concern that despite many requests to Medsafe to participate in these discussions, they had chose not to attend. In the electromedical area it is proposed that the EMECC will provide a schedule of appropriate standards that would satisfy compliance requirements.
- The Energy Safety Services plan, mentioned later, has a specific section on Electromedical equipment. This work was endorsed by the committee and adopted as the basis for activity in the coming years.
- The latest amendment to the Electricity Regulations came into effect on 1st January. ECP12 has now been superseded by the fact that AS/NZS 3003, AS/NZS 3551 and AS/NZS 2500 have been directly cited in the Regulations as a means of compliance. Delays with completion of AS/NZS 2500 and 3551, by Standards Australia have necessitated New Zealand only amendments for these two documents as an interim step. It is hoped that AS/NZS 3003 will be published in the first quarter of this year.

### Energy Safety Service - Powersafe - 5 Year Plan

Over the last 12 months there have been a number of working groups pulling together the

material for a 5 year Safety Plan for the Electricity Industry. The aim of the document is to ensure:-

- A long term commitment to safety
- Safe supply and use of electrical appliances and equipment in a reliable and economic way
- Consistent performance based legislation, which is linked to the Energy Safety Programme.

Andrew Patterson attended the launch of the document in the beehive as a representative of the Institute.

The full plan is available on the Energy Safety Service's website -

[www.ess.govt.nz/safety/safety\\_electricity.asp](http://www.ess.govt.nz/safety/safety_electricity.asp)

### Standards New Zealand - Health Strategy Meeting

As a consequence of the Joint Health Standards Board, between Australia and New Zealand, being de-jointed by the Australians, it was agreed Standards NZ should take the initiative and run a session to identify issues within the NZ Health sector and what could be assisted with the development of appropriate standards based solutions.

There was an excellent multidisciplinary group in attendance for the half day workshop. Representatives came from Health & Disability Commissioner, ACC, Energy Safety Service, Ministry of Health, Public and Private Sector Providers, Biomed and Facilities Managers. Many commented that this was most likely the first time that such a wide cross section of personnel had gathered to consider health issues. Andrew Patterson and I attended as

representatives of our particular disciplines.

The aim of the session was to identify from a Consumer Safety perspective what were the issues and what standards based solutions could be developed.

Areas identified were :-

- Continuum of care
  - Standards for care
  - Information
  - Workforce
  - Learning from mistakes
  - Communications
  - Coordination
  - Standards for equipment
  - Consumer rights
  - Facilities
  - Informed risk management system
  - Training
- 

The next step is for Standards NZ to investigate which areas would be appropriate for Standards based solutions.

In the closing session members also provided a short list of items that they felt needed attention to resolve particular issues that are present within the Health Sector. In order to move forward with the many issues that were identified, there will need to be a significant amount of communication with the many industry groups and that can only have a positive outcome.

Tony Blackler

### Editor's Notes

Members of the Institute should note the change in the position of Secretary / Treasurer where Bill MacDougall has taken over from Max Christensen.

The new P.O. Box number and E-mail address is in the Executive Officers Panel on page 1

On a personal note I would like to thank Max for the great job he has done in the five years that he has held the twin positions of Secretary /Treasurer. During this period he has been a great supporter of The Health Engineer, continually passing on overseas publications from which we can copy interesting articles, and keeping me supplied with reports etc Thank you Max for all your help, encouragement and support.

We would now like to welcome Bill into his new position. After the magnificent job he and his team did with the Auckland Conference he should find the Secretary /Treasurer job much quieter

Max will not be lost to the Executive, however, as he takes Bill's place as an Executive Officer

In this issue we have included advertisements from two of our Conference sponsors, namely Beca and Fisher & Paykel Healthcare as part of the sponsorship agreement. We will publish advertisements from Cleantech Services Ltd and Cass Medical in our next issue.

Jim Logan, Editor



## ***NZIHEEM Engineer/Biomed of the Year***

This document is the Final proposal for BOC Medical to provide sponsorship of the award for the Hospital Engineer/Biomed of the year.

### **Scope of Award**

- The award shall be open to Facilities Engineers and Biomedics who are full time employed in providing services to Hospitals in New Zealand.
- The award will be to provide recognition for an individual member who meets or exceeds the criteria outlined below.

### **The Award**

- Travel and accommodation to the value of \$2,000 NZD to attend a relevant Healthcare conference as approved by the committee. A suitable framed certificate will also be provided.
- There should also be two highly commended runners up who will receive a framed certificate.
- BOC Medical proposes that sponsorship be for an initial period of 5 years and we reserve the right to review the award at this time.

### **Nominations**

Nominations shall be from financial members of the NZIHEEM.

Nominations shall be at least a 500 word description of the environment, performance and influence the candidate has had on the organisation and its environment.

Hard statistical evidence will be highly regarded by the judges.

### **Criteria for judging purposes**

The individual shall have exhibited special qualities within the field of their work and the organisation they are employed by.

This should include such things as :-

- 1) Leadership
- 2) Technical excellence
- 3) Facilitated a project which has benefited the organisation they are employed by
- 4) Acknowledged by their peers
- 5) Initiative

It would be unlikely that the same candidate would receive the award in successive years unless they did something most outstanding when compared to other nominations.

### **Judging**

The judging should be carried out by a sub committee of the executive and a BOC Medical nominated representative.

### **Presentation**

The awards should be presented at the annual conference of the NZIHEEM.

### **Reporting Back**

- The winner of the award will be required to report back to the NZIHEEM members what they have learnt from attendance of the Healthcare conference.
- This could include such things as new methods and concepts or on projects which may be of value to other members and their organisations.