

Highlights

- **2002 WESTERN REGIONAL CONFERENCE**
- **ACES Social Event – June 2002**
- **Bylaws updated... Student memberships!**
- **Professional Accountability... History of ACES**



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The Alberta Clinical Engineering Society Newsletter

April 2nd, 2002

Presidents Letter

by Kay Henke, R.E.T., President

Once again, ACES is off to a great start this term, after a productive and informative Annual General Meeting in Red Deer on February 9, 2002. We have new members on the Executive, all of whom are listed later in this publication. Plans for the Western Regional Biomedical Engineering Conference 2002 are well under way, with Bob Larkin as a Keynote Speaker. Joe Reynolds is doing a superb job organizing the Conference. Our Web site is current and up to date. We are on a roll!

But we need more volunteers. Why DO we volunteer, anyway? What is it that drives someone like you or me to be compelled to add more tasks to an already full agenda? It certainly is not the cash!! After a little research, I have come up with a few convincing reasons:

- We desire to help others.
- We want to feel useful.
- Volunteering boosts our self-esteem.
- Studies show that volunteers live longer.
- We can do something we really love, for the love of doing it, but still be helping in some way-Bonus!
- We desire to learn new skills.
- We can meet new friends with the same interests as us.
- Volunteering can get us out of a dull routine.

Wow-you need to Volunteer for ACES, TODAY! We can offer you all the above benefits, and more! Contact Joe Reynolds, Conference Coordinator, and let him know that you are interested. He will be more than happy to fill you in on how you can help us make the upcoming Conference a huge success!

ACES Social Event

ACES is planning a Social Event for June of 2002 please check the website soon for more details!

Planning for 2002 Western Regional Conference Underway

by Joe Reynolds, Conference Director

Preliminary planning is well underway for another joint conference with our compatriots from IBET. This year the conference will be held in Sherwood Park at the Sherwood Best Western Hotel and Conference Centre; it will feature **Bob Larkin**, editor of 24 x 7 magazine, as keynote speaker. This venue is right beside the new Millennium Place athletic facility so

bring your workout togs if so inclined. I am still looking for volunteers to help with the organization of this immense undertaking. The most crucial positions to fill at this time are and Education Coordinator and Trade Show Coordinator. These positions are vital to ensure the success of our conference. Volunteers can reach Joe Reynolds at 780-460-6218, or via e-mail at jrreynol@cha.ab.ca

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Special Thanks To Our February AGM Sponsor.



GE Medical Systems Canada



GE did an excellent presentation on “Asset Tracking – Root Challenges, Symptoms faced by Canadian Hospitals and Possible Solutions” and feed all the hungry biomed.

For more information Contact:

Jon Abrams

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A Look Back... The History of the Alberta Clinical Engineering Society

by Denny Mellott

Pre-ACES History

In 1987 Ken McDonald started the Biomedical Engineering Technology

program at the Northern Alberta Institute of Technology (NAIT).

In the late 1980s to early 1990s the Alberta Biomedical Engineering Technology Association (ALBETA) was formed.

In approximately 1992-1993 the Northern Alberta Clinical Engineering Society was formed.

ACES History

ACES was formed in 1994 when the Calgary based group ALBETA and the Edmonton based group NACES joined together. Ron Van Vliet, the first ACES President, says that ACES “was born from a communicated need for networking, developing a distinct identity for clinical engineering professionals, and for co-ordinating education/training.”

ACES Timeline:

1994 – Alberta Clinical Engineering Society (ACES) formed

1994 – ACES Bylaws Written

1994 – ACES logo was developed by Ron Van Vliet.



1995 – ACES crest was developed by Dave Burry.



1996 – ACES website goes live

1998 – ACES hosts CMBEC24

1999 – First ACES / IBET joint Western Regional conference

2002 – ACES Bylaws Revised

2002 – ACES offers free student memberships

ACES Presidents:

1994 - Ron Van Vliet

1995 - Margarita Loyola

1996 - Chuck Evans

1997 - Brandon Beaudry

1998 - Brandon Beaudry

1999 - Bill Rutledge

2000 - Denny Mellott

2001 - Denny Mellott

2002 - Kay Henke

I would like to continue updating the history of ACES. If you have/remember any history of ACES or its predecessors ALBETA or NACES, including logos, minutes, newsletters, anything, please contact me:

Denny Mellott

denny.mellott@calgaryhealthregion.ca

Special Thanks to the following for helping to prepare this article: Ron Van Vliet, Ken McDonald, Margarita Loyola, Brandon Beaudry, Robin Fair, Jim Duncan, and Dave Burry.

Professional Accountability & the Technology Professional

by Martin Mac Gregor, ASCT.

Professional Accountability may not sound exciting, but it is a topic that conceals some very real issues for Technology Professionals. So what actually is Professional Accountability? Who is accountable to whom and who is a professional anyway?

Accountability and accountable, those terms have a ring of subservience to them...but to whom or what? Professional, that has that ring of authority, but again but to whom or what? So the whole phrase, Professional Accountability, intimates a conundrum!

The Canadian Oxford Dictionary actually describes accountability as “liable to give account, responsible”.

So then what is a Professional...again the dictionary defines it as “someone engaged in a branch of science or learning”.

And what about Engineering or Technology? Engineering meaning “to construct, manage or arrange physical objects” and Technology being “the science of industrial arts”.

So then what about this Accountability matter? Perhaps what accountability actually means is that you are responsible for doing what is just and fair, respecting others' rights. Such as their right to assume that the work you do is beyond reproach. That is the higher calling of accountability, far beyond the vaunt of calling yourself professional!

As Francis Bacon, that noted Elizabethan philosopher and statesman remarked in the preface to his work, *The Elements of Common Law*. "I hold every man a debtor to his profession".
Meaning...I hold that every man has a duty to his branch of learning or science.
Paraphrased...Professionally Accountable.

So you are a debtor to your profession meaning you must govern your actions by doing what is just and fair.

What is just and fair or what is ethical, is too often very complex and difficult to be objective about. As mere mortals we can but 'do our very best' on a day-to-day basis and look for higher guidance in our dealings with our fellow man.

Not in the realms of higher guidance, but certainly a very practical guide to ethical conduct in our professional lives is the Code of Ethics and Practice Standard Guidelines published by most professional bodies for their members.

A sort of Code of Moral Conduct, these are guidelines to professional actions through a heightened awareness of our responsibility to ourselves and **most importantly others**.

A Professional Act will generally require the establishment, maintenance and development of Standards of Ethics amongst its members. As well an Act will likely require the Association to do lawful things that are incidental to the accomplishment of such objectives.

So when a Legislature enacts such an Act it is saying...here are a group of Professionals who owe a duty of care to the public, each other and their employers and we are going to give this Association the power to discipline any who fail in this duty of care. We the elected representatives want to see

proper Professional Accountability within this group.

That is why for someone who maliciously flouts their Code of Ethics, under such Acts there will be a body as a Practice Review Board and provisions for Disciplinary Committees and appropriate penalties. Such penalties could typically range from specified further education to ultimately expulsion from membership and possibly fining. And please bear in mind this is apart from any civil penalty or censure by an employer.

Here is where the difference between a qualified and a certified individual becomes apparent. Possession of a qualification just says I have passed this exam, it teaches us how to "be a wise fool" as someone else once said. **Certification certainly says more, that an individual has the required education and has demonstrated a certain level of competency in the work they do.**

When you voluntarily place yourself under a code of conduct by becoming certified you are now also making yourself Professionally Accountable

This demands much more than just pleasing your supervisor or employer, it requires that you ask all 'customers' of your actions to be judges of your conduct, and that particularly includes yourself. As was once observed, the mark of a true professional is often more in knowing what you are not qualified to do.

Professional Accountability – it is a debt you will always owe to your practice of industrial arts.

Martin Mac Gregor, ASCT.
(IEng, MIIIE - UK)
Director, Professional Standards & Registrar,
Applied Science Technologists &
Technicians of British Columbia.

Calgary Health Region Update

by Kelly Kabe

Here are a few new things happening in the Calgary region.

Equipment evaluations on adult ventilators and smoke evacuators have been

completed and an evaluation on transport ventilators is nearing completion.

We completed a Siemens Ventilator training course in Calgary and are looking forward to some more upcoming courses in Calgary, Hill-Rom Incubators and Infant Warmers, Philips Sonos 5500, Baxter pumps, ERBE Electrosurgery units and one on the Arrow Intra Aortic Balloon Pump.

There are some minor construction news happening in the region. At the **Foothills** (FMC), our DI shop has been temporarily relocated while the air handling system in that area is upgraded. At the **Children's** (ACH), ongoing planning for a new Children's Hospital. At the **Rockyview** (RGH), the new Special Care Nursery renovations to start soon. At the **Peter Lougheed** (PLC), the newly renovated Code room in Emergency has been completed but still waiting for the delivery of two new Defibrillators. Network lines have been completed for the Anesthesia PICIS project.

Last October a project began to upgrade the Calgary Health Region's telephone system. This project will see all four acute care sites as well as the Colonel Belcher and Southport sites to be connected by an internal telephone network, allowing the phone system to function as one site. This will see only two prefixes of 943 and 944. Yes, all the Clinical Engineering shop phone numbers will be changing between May and July, but will have interception until January 31st 2003. This new system will allow calls as if you're on the same site (5 digit dialing), Call forwarding between sites, voice messages and ring again features.

Computerized Maintenance Management System (CMMS) update: We are still continuing to enter PM procedures, we have nearly completed the Critical 2 equipment and then it's onto the Critical 3 equipment. A big thank you to everyone for their hard work and fitting in the PM procedures into their already busy schedules.

Capital Health Authority Update

by?

No update available at time of publication!

Chinook Health Region Update

by Kay Henke, R.E.T.

Greetings from L.A.-When IS it going to be Spring, anyway?? Soon I hope. Meanwhile here's the latest news from the Chinook Health Region:

In August of last year, Scott Olsen left the Biomed Division for greener pastures at Toshiba Medical. Lucky for us, Darrel Nilsson wanted to move to the Sunny South from Grande Prairie and he joined us at the end of October. He and his family are settling in nicely and we are grateful for his experience and expertise as a Biomed. Welcome to the CHR, Darrel!

On February 12, we had the pleasure of taking in a workshop put on by Carsen Group Inc., entitled "Flexible Endoscope Assessment Workshop", with Alasair MacArthur as the Speaker. He put on a super power point presentation, full of anecdotes, photos and diagrams. All who attended agreed that the information is invaluable to saving hospital \$ through proper assessment and tracking of these expensive inventory items. The all-day session included the functional components of the endoscope and a typical sequence of failure and associated symptoms of those failures. And, of course, the lunch provided by Carsen Group Inc. was a big hit as well.

The results of the CHR's Accreditation Survey are in and we're good for another three years! The survey team visited all 17 CHR facilities as well as St. Michael's Heath Centre, Extencicare Lethbridge and Fort Macleod, Coaldale Health Centre and Edith Cavell Care Centre. The report was very positive, listing many strengths of the organizations and their staff.

Our corporate Website has been updated to include new images, more links and more info of interest to CHR employees and the community as a whole. Almost anything you need to know about CHR is on the Website!

Our Region was granted funds for a Telehealth Network. Video Conferencing equipment will be installed at Lethbridge, Taber, Pincher Creek and Crowsnest Pass hospital sites and will be accessible to physicians and CHR staff throughout the entire Region. Some uses for the Network would include remote diagnoses and treatment, educational opportunities, and

remote site meetings. Sounds like it might come in handy for an ACES Video Conference sometime...

A new Quality Management Software package called medQM has been purchased and installed. It is designed to capture and retrieve data that has already been entered and collected in MEDITECH Modules, and will be used by managers and directors to seek accurate information regarding the quality of the service delivery in their areas.

The budget of last week dealt a fairly large blow to our community, including a large deficit in funding to the CHR. In a memo to all staff, CEO, Gil Tourigny stated that there would be cutting of programs and laying off of personnel. Hmmm-could be a long, hot summer ahead.

On a happier note, we are looking forward to the ACES Social Event to be held in June, and hope to see you there!

David Thompson Regional Health Authority Update

by?

No update available at time of publication!

Mistahia Regional Health Authority Update

by Orrin Stephen

There has been a 100% turnover in the biomed staff here at the Mistahia Health Authority (Grande Prairie).

Lans left somewhere around July for a job at the Misericordia Hospital in Edmonton, and Darrel left in October for a job in Lethbridge. They hired myself (Orrin Stephen) in between these two events (late August), then Sean Hanlon, a new graduate of Fanshaw College in London Ontario, in December. In February they hired a senior biomed, Darcy Russell, who has 7 years experience working for the Brandon Regional Health Authority, which services 191 of the rural hospital in Manitoba.

The other big thing that happened is we finally moved into our new biomed shop on the second floor, right beside the ICU, the OR, and down the hall from the Special Care Nursery & Labor and Delivery. We couldn't be any closer to the equipment we service most, and it is a huge improvement on our old "hole" in the basement which was never designed to be anything more than a storage area. Everyone always comments that we have to be one of the few biomed shops with windows and a view, (on a very clear day, if you look very hard you can actually see the first range of the Rockies), but the thing I like the best is how close it is to things, and the fact that we had the opportunity to re-organize things the way we wanted.

The three of us are cautiously optimistic that we will be able to make enough changes here to make a thriving biomed department.

Northern Lights Regional Health Services Update

by Graham Bruce, C.E.T.

SPRING GREETINGS FROM UNDER THE NORTHERN LIGHTS

Let see where things are at since last you read about the goings on up north.

We still wait the transition to new television system, no new televisions have arrived, we are still waiting to get the new nurse call/ t.v. control units that will work with the new television, they put out a digital signal to the t.v.. Suppose to be done by now.

The Lab/ Medical Records renovation has yet to get underway as we are still trying to find a new home for the morgue. It is getting closer to starting with each passing week.

The new beds for Long Term Care were STRYKER/BERTEC brand, kinda slick. Not a whole lot of fancy stuff, just good solid units.

Updating the new equipment in O.R.: We will be trialing some new heated vaporizers. Another thing that plugs in. Someone explain to me why vapourized anesthetic gas needs to be warmed?????

{[EDITOR'S NOTE](#): Please read the article **Variable-Bypass Vaporizers and the Desflurane Vaporizer** by J. Jeff Andrews, M.D. for some insight into that question and more!}

Otherwise things running smoothly with the new setups.

Moving on to new things.

We are beginning evaluation of new isolettes for Maternal Child (OBS), as our current units are OHIO models, which are 20+ years old. We will begin with Ohmeda's model, which will be inserviced in mid March. We will also be looking into a new transport isolette unit as I have just been informed by

HILL ROM that our current model, a AIR SHIELDS unit is going obsolete at the end of 2003 Anyone have any comment on a good unit in this category just let me know.

The facility is currently getting inservices on "needleless" infusion system since we are due to renew our contract for these supplies. ALARIS, BAXTER AND ABBOTT are the contenders. Although with Baxter infusion pumps throughout the facility it would seem that they have a slight edge.

Our new smoke evacuator for use with electrological unit in O.R. has arrived. We have 3 unit two for the O.R. area and one, which will swing back and forth between O.R. and Ambulatory Care area.

The Biomedical department (myself) will be hosting a NAIT practicum student in May. It is the first time that a NAIT student has chosen to come here. Way back in the late eighties we were regularly contact by NAIT and asked if we would host a student and we always said yes but none ever came. NAIT stopped calling after a few years. I am looking forward to it, as it will give me a chance to be critiqued by an outsider. If it is a successful venture, I hope to try and make it a regular event.

At this writing, we (I mean the entire province) await the coming of the budget on March 19th, to see what our futures look like. They sure are waiting till the last possible moment. Really putting the pressure on all of us.

Not a whole lot else to report on at this time, lots of new equipment or replacement equipment depends upon the budget. Meanwhile we must find new and creative ways to reduce the costs. Keep things running as long as possible. Ever onward: higher, faster, and stronger.

Bye for now.
Your colleague
Graham Bruce, BMET, CET

NAIT Update

by Roy Sharplin

We are into the last few weeks of classes; the graduating class is looking forward to their Practicum placements. Practicum placements will begin on April 29.

Although we are still negotiating the final placements it looks like we will have one student in Calgary, one in Red Deer, 14 in Edmonton, possibly one in Fort McMurray, and possibly two in Brandon Manitoba. Our Weekly Field Practice program has been very successful and on behalf of all our students and faculty, thanks to everyone in Capital Health for your support. On April 3 we will be hosting our 8th annual industry mixer night. This is an excellent opportunity for us to discuss the future of our program with the local biomedical community and for our students to introduce themselves personally to the community. It has been a great year full of challenges and successes; the students have been awesome. During May and June our faculty will be busy developing curriculum and planning for next year. Thanks again for all the support we receive from ACES.

**Attention NAIT Students :
ACES now offers free student
memberships... Sign up today!**

CFB Edmonton Update

by Tom Reid

As we speak MCpl Paul Beyette, 2000 NAIT grad, is packing his kit bag and is deploying to Bosnia for a Technical Assistance Visit. He will be in country for approximately 3 weeks doing PM's and repairs to field medical and dental equipment. We are

anxiously awaiting the graduation of this years class so we can put 3 new techs to work across the country. Randy Bouvier will be staying in Edmonton, Tim Mills is off to Petawawa and Darryl Newman is going to Valcartier. Our current staff here is going to the Atlantic BMET Conference in Moncton, NB in April. Other than that things are pretty much normal around here. Once spring comes we will be off on semi-annual visits to all of our Prairie Units.

Variable-Bypass Vaporizers and the Desflurane Vaporizer

by J. Jeff Andrews, M.D.
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Introduction

Through the years, vaporizers have evolved from rudimentary ether inhalers to copper kettles to the present day temperature-compensated, variable-bypass vaporizers. With the introduction of the new inhaled anesthetic, desflurane, an even more sophisticated, electrically heated, pressurized, electronically controlled vaporizer has been introduced. Both variable-bypass vaporizers and the new Tec 6 desflurane vaporizer are discussed below.

Variable-Bypass Vaporizers

Variable-bypass vaporizers are used to deliver halothane, enflurane, isoflurane, and sevoflurane but not desflurane. Examples of variable-bypass vaporizers include the Ohmeda Tec 4, the Ohmeda Tec 5, and the Dräger Vapor 19.1. They are classified as variable-bypass, flow-over, temperature-compensated, agent-specific, out-of-circuit vaporizers. (1) Variable-bypass refers to the method for regulating output concentration. As gas flow enters the vaporizer's inlet, the setting of the concentration control dial determines the ratio of flow that goes through the bypass chamber and through the vaporizing chamber. The gas channelled to the vaporizing chamber flows over the liquid anesthetic and becomes saturated with vapor. Thus, flow-over refers to the method of vaporization. The Tec 4, the Tec 5, and the Vapor 19.1 are classified as temperature-compensated because they are equipped with

an automatic temperature-compensating device that helps maintain a constant vaporizer output over a wide range of temperatures. These vaporizers are agent-specific and out-of-circuit because they are designed to accommodate a single agent and to be located outside the breathing circuit.

Figure 1 demonstrates the operating principles of variable-bypass vaporizers. Flow from the flowmeters enters the inlet of the vaporizer. More than 80% of the flow passes straight through the bypass chamber to the vaporizer outlet, and this accounts for the name "bypass chamber." Less than 20% of the flow from the flowmeters is diverted through the vaporizing chamber. Depending on the temperature and vapor pressure of the particular inhaled anesthetic, the flow through the vaporizing chamber entrains a specific flow of inhaled anesthetic. All three flows, that is, flow through the bypass chamber, flow through the vaporizing chamber, and flow of entrained anesthetic, exit the vaporizer at the outlet. The final concentration of inhaled anesthetic is the ratio of the flow of the inhaled anesthetic to the total gas flow. (1, 2)

The vapor pressure of an inhaled anesthetic depends on the ambient temperature. For example, at 20C the vapor pressure of isoflurane is 238 mmHg, whereas at 35C the vapor pressure almost doubles (450 mmHg). Variable-bypass vaporizers have an internal mechanism to compensate for different ambient temperatures, and the temperature-compensating valve of the Ohmeda Tec 4 is shown in Figure 2.3 At high temperatures, such as those commonly used in pediatric or burn operating rooms, the vapor pressure inside the vaporizing chamber is high. To compensate for this increased vapor pressure, the bimetallic strip of the temperature-compensating valve leans to the right. This allows more flow to pass through the bypass chamber and less flow to pass through the vaporizing chamber. The net effect is a constant vaporizer output. In a cold operating room environment, the vapor pressure inside the vaporizing chamber decreases. To compensate for this decrease in vapor pressure, the bimetallic strip swings to the left, causing more flow to pass through the vaporizing chamber and less to pass through the bypass chamber. The net effect is a constant vaporizer output.

Electrically Heated, Pressurized Vaporizers

Controlled vaporization of desflurane requires an electrically heated, pressurized vaporizer because of desflurane's unique physical properties. (4) Desflurane's vapor pressure is three to four times that of contemporary inhaled anesthetics, (5) and it boils at 22.8C, (6) which is near room temperature. Desflurane is moderately potent, with minimum alveolar anesthetic concentration (MAC) values of 6% to 7%. (7) Desflurane is potentially valuable because it has a low blood gas solubility coefficient of 0.45 at 37C, (8) and recovery from anesthesia is more rapid than with other potent inhaled anesthetics. (9)

To achieve controlled vaporization of desflurane, Ohmeda has introduced the Tec 6 vaporizer, which is electrically heated and pressurized. (10) The physical appearance and operation of the Tec 6 are similar to contemporary vaporizers, but some aspects of the internal design and operating principles are radically different. A simplified schematic of the Tec 6 is shown in Figure 2. There are two independent gas circuits, the fresh gas circuit (gray) and the vapor circuit (white). The fresh gas from the flowmeters enters at the fresh gas inlet, passes through a fixed restrictor (R1), and exits at the vaporizer gas outlet. The vapor circuit originates at the desflurane sump, which is electrically heated and thermostatically controlled to 39C, a temperature well above desflurane's boiling point. The heated sump assembly serves as a reservoir of desflurane vapor. At 39C, the vapor pressure in the sump is 1500 mmHg absolute, or approximately 2 atmospheres absolute. Just downstream from the sump is the shut-off valve. After the vaporizer warms up, the shut-off valve fully opens when the concentration control valve is turned to the on position. A pressure-regulating valve downstream from the shut-off valve downregulates the pressure to approximately 1.1 atmospheres absolute (74 mmHg gauge) at a fresh gas flowrate of 10 L./min. The operator controls desflurane output by adjusting the concentration control valve (R2), which is a variable restrictor. (4)

The vapor flow through R2 joins the fresh gas flow through R1 at a point downstream from the restrictors. Until this point, the two circuits are physically divorced. They are interfaced pneumatically and electronically, however, through differential pressure

transducers, a control electronics system, and a pressure-regulating valve. When a constant fresh gas flowrate encounters the fixed restrictor, R1, a specific back pressure, proportional to the fresh gas flowrate, pushes against the diaphragm of the control differential pressure transducer. The differential pressure transducer conveys the pressure difference between the fresh gas circuit and the vapor circuit to the control electronics system. The control electronics system regulates the pressure-regulating valve so that the pressure in the vapor circuit equals the pressure in the fresh gas circuit. This equalized pressure supplying R1 and R2 is the working pressure, and the working pressure is constant at a fixed fresh gas flowrate. If the operator increases the fresh gas flowrate, more back pressure is exerted upon the diaphragm of the control pressure transducer, and the working pressure of the vaporizer increases. (4)

Table 1 shows the approximate correlation between fresh gas flowrate and working pressure for a typical vaporizer. At a fresh gas flowrate of 1 L./min, the working pressure is 10 millibars, or 7.4 mmHg gauge. At a fresh gas flowrate of 10 L./min, the working pressure is 100 millibars, or 74 mmHg gauge. Therefore, there is a linear relationship between fresh gas flowrate and working pressure. When the fresh gas flowrate is increased tenfold, the working pressure increases tenfold. (4)

The following two specific examples help demonstrate the operating principles of the Tec6.

Example A:
Constant fresh gas flowrate of 1 L./min with an increase in the dial setting.

With a fresh gas flowrate of 1 L./min, the working pressure of the vaporizer is 7.4 mmHg. That is, the pressure supplying R1 and R2 is 7.4 mmHg. As the operator increases the dial setting, the opening at R2 becomes larger, allowing more vapor to pass through R2. Specific vapor flow values at different dial settings are shown in Table 2.

Example B:
Constant dial setting of 6% with an increase in fresh gas flow from 1 to 10 L./min.

At a fresh gas flowrate of 1 L./min, the working pressure is 7.4 mmHg, and at a dial setting of 6% the vapor flowrate through R2

is 64 ml/min (Tables 1 and 2). With a tenfold increase in the fresh gas flowrate, there is a concomitant tenfold increase in the working pressure to 74 mmHg. The ratio of resistances of R2 to R1 is constant at a fixed dial setting of 6%. Because R2 is supplied by ten times more pressure, the vapor flowrate through R2 increases tenfold to 640 ml/min. Vaporizer output is constant because both the fresh gas flow and the vapor flow increase proportionally.

Because desflurane's vapor pressure is near one atmosphere, misfilling contemporary vaporizers with desflurane can theoretically cause desflurane overdose and hypoxemia. (5) Ohmeda has introduced a unique, anesthetic-specific filling system to minimize occurrence of this potential hazard. The agent-specific filler cap of the desflurane bottle prevents its use with traditional vaporizers. The filling system also minimizes spillage of liquid or vapor anesthetic by maintaining a "closed system" during the filling process. Each desflurane bottle has a spring-loaded filler cap with an O-ring on the tip. The spring seals the bottle until it is engaged in the filler port of the vaporizer. Thus, this anesthetic-specific filling system interlocks the vaporizer and the dispensing bottle, preventing loss of anesthetic to the atmosphere.(10)

Major vaporizer faults cause the shut-off valve located just downstream from the desflurane sump (Figure 2) to close, producing a "no-output" situation. The valve is closed and a no-output alarm is activated immediately if any of the following conditions occur: the anesthetic level decreases to below 20 cc; the vaporizer is tilted; a power failure occurs; or there is a disparity exceeding a specified tolerance between the pressure in the vapor circuit and the pressure in the fresh gas circuit. (10)

Summary

The Tec 6 vaporizer is an electrically heated, thermostatically controlled, constant-temperature, pressurized, electromechanically coupled, dual circuit, gas/vapor blender. The pressure in the vapor circuit is electronically regulated to equal the pressure in the fresh gas circuit. At a constant fresh gas flowrate, the operator regulates vapor flow using a conventional concentration control dial. When the fresh gas flowrate increases, the working pressure increases proportionally. At a specific dial

setting at different fresh gas flowrates, vaporizer output is constant because the amount of flow through each circuit is proportional. (4)

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What is CE Marking?

by *Phil Gardiol, QNET LLC*
<http://www.ce-mark.com>

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The European Commission refers to the CE Marking of products as a "passport" which can allow a manufacturer to freely circulate their products within the European marketplace. The marking applies only to products regulated by European health, safety and environmental protection legislation (product directives) but this is estimated to include more than 50% of the goods currently exported from the U.S. to Europe.

The actual CE Marking is the letters "CE" which a manufacturer affixes to certain products for access to the European market (consisting of 18 countries and also referred to as the European Economic Area or EEA).

The letters "CE" are an abbreviation of a French phrase "Conformite Europeene". The marking indicates that the manufacturer has conformed with all the obligations required by the legislation. Initially, the phrase was "CE Mark": however, "CE Marking" was legislated as its replacement in 1993.

Letter from the Editor

by *Denny Mellott, C.E.T.*

It is my pleasure to take over as the newsletter editor for 2002. I look forward trying to make newsletter into something that everyone in the biomedical community can enjoy. I am always looking for article ideas that would be of interest to our readers, if you have something that may be of interest please contact me.

Newsletter Advertising

Are you interested in advertising your company and services or do you have items you would like to sell? Then placing an advertisement with the ACES newsletter is an excellent way to reach the Alberta Clinical Engineering community. In addition, all

newsletters are posted to the World Wide Web. Your ad will therefore also be available to the international clinical community.

Advertising Rates:

Business Card \$ 75.00

Half Page Ad \$150.00

If you would like to advertise on the ACES newsletter or have any questions please contact:

Denny Mellott

Phone: 403-291-8069

E-mail:

denny.mellott@calgaryhealthregion.ca

Member Feedback & Recognition

ACES is an organization dedicated to our members and the field of Clinical and Biomedical Engineering. As a member of

ACES you are entitled to provide your input into the activities of the committee.

Please forward all ideas and comments directly to a member of the ACES Executive. For a list of your executive please see the beginning of this newsletter or visit the **ACES Web**

Page @ <http://www.aces.ab.ca>

Special Recognition

If someone you know has made an outstanding contribution to the field of Biomedical or Clinical Engineering please nominate that person by sending an email message outlining that contribution to brutledge@cha.ab.ca.

Congratulations to all of Team Canada for an excellent job at the 2002 Olympic Winter Games!



Spring Ahead!

Don't forget! The change from Mountain Standard Time to Daylight Savings Time will occur at 0200 hours on Sunday, April 7, 2002.

JOIN ACES !!

To enjoy the benefits of ACES, and ensure that you continue to receive the ACES newsletter and meeting notices, Become a member!

Complete the following Information form, and return with payment in the amount \$10.00 (free for Students) to:

The Alberta Clinical Engineering Society
#372, 916 – 16th Avenue NW
Calgary, Alberta T2M 0K3

Name: _____

Home Address: _____

City/Prov: _____

Postal Code: _____

Ph: (____) _____

Email: _____

Business Information:

Company: _____

Position: _____

Department: _____

Room: _____

Address: _____

City/Prov : _____

Postal Code: _____

Ph:(____) _____ Ext: _____

Email: _____

Alberta Clinical Engineering Society

Official By-Laws

FEBRUARY 2002

MEMBERSHIP

1. Any persons with an interest in the field of Clinical or Biomedical Engineering in the province of Alberta may become a member upon payment of a membership fee. Such fees shall be determined, from time to time, by the members at a general meeting.

1a. Any full-time student in an approved Engineering or Engineering Technology program may become a student member upon the students' request and approval of the board. This student membership shall be at no charge. Student members are entitled to all membership privileges in the society except that they may not hold a position on the board and shall be non-voting members.

2. Any member wishing to withdraw from membership may do so upon "Proper Notification" to the Board through its Secretary. If any member is in arrears for fees or assessments for any year, such member shall be automatically suspended at the expiration of six months from the end of such year and shall thereafter be entitled to no membership privileges or powers in the society until reinstated. Any member, upon a majority vote of all members of the society in good standing, may be expelled from membership for any cause which the society may deem reasonable.

BOARD OF DIRECTORS

3. Board of Directors, Executive Committee or Board, shall mean the Board of Directors of the society.

4. The Board will be elected by vote at the annual general meeting of the society. Such voting shall be by ballot, unless the meeting, by resolution otherwise decides. The Board shall consist of nine (9) members.

5. At the first meeting of the Board, to occur within a month of the annual general meeting the Board members shall appoint from among themselves a President, Vice-president, Secretary, Treasurer, and Chairpersons of standing committees as the Board deems necessary. The President cannot be a standing committee chairperson; however, other officers may act as standing committee chairpersons in addition to their executive duties.

6. The Board shall, subject to the by-laws or directions given it by majority vote at any meeting properly called and constituted, have full control and management of the affairs of the society, and meetings of the Board shall be held as often as may be required, but at least once every three months, and shall be called by the President. A special board meeting may be called on the instructions of any two members thereof provided they request the President, with "Proper Notification", to call such meeting and state the business to be brought before the meeting. Meetings of the Board shall be called by three days' notice with "Proper Notification". A quorum consists of a majority of the board members. Meetings may be held without notice if a quorum of the Board is present, provided however, that any business transactions at such meeting shall be ratified at the next regularly called meeting of the Board, otherwise they shall be null and void.

7. Any director or officer, upon a majority vote of all members in good standing, may be removed from office for any cause which the society may deem reasonable.

PRESIDENT

8. The President shall be ex-officio a member of all Committees. He/she shall, when present, preside at all meetings of the Board. The president may only vote to break a tie. In his/her absence the Vice-President shall preside at any such meetings, and in the absence of both a chairperson may be elected by the meeting, to preside thereat.

SECRETARY

9. It shall be the duty of the secretary to attend all meetings of the society and of the Board, and to keep accurate minutes of the same. He/she shall have charge of the Seal of the society which seal whenever used shall be authenticated by the signature of the Secretary and the President or, in the case of the death or inability of either to act, by the Vice-President. In case of the absence of the Secretary, his/her duties shall be discharged by such officer as may be appointed by the Board. The Secretary shall have charge of all the correspondence of the society and be under the direction of the President and the Board.

10. The Secretary shall also keep a record of all the members of the society and their addresses, send all notices of the various meetings as required, and shall collect and receive the annual dues or assessments levied by the society. Such monies to be promptly turned over to the Treasurer for deposit in a Bank, Trust Company, Credit Union or Treasury Branch as hereinafter required.

TREASURER

11. The Treasurer shall receive all monies paid to the society and shall be responsible for the deposit of same in whatever Bank, Trust Company, Credit Union or Treasury Branch the Board may order. He/she shall properly account for the funds of the society and keep such books as may be directed. He/she shall present a full detailed account of receipts and disbursements to the Board whenever requested and shall prepare for submission to the Annual Meeting a statement duly audited as hereinafter set forth of the financial position of the society and submit a copy of same to the Secretary for the records of the society. The office of the Secretary and Treasurer may be filled by one person if any annual meeting for the election of officers shall so decide.

AUDITING

12. The books, accounts and records of the Secretary and Treasurer shall be audited at least once each year by a duly qualified accountant or by two members of the society elected for that purpose at the Annual Meeting. A complete and proper statement of the standing of the books for the previous year shall be submitted by such auditor at the Annual Meeting of the society. The fiscal year of the society in each year shall be I January to 31 December.

13. The books and records of the society may be inspected by any member of the society at the annual meeting provided for herein or at anytime upon giving reasonable notice and arranging a time satisfactory to the officer or officers having charge of same. Each member of the Board shall at all times have access to such books and records.

MEETINGS

14. This society shall hold an annual meeting at least once in each year; "Proper Notification" shall be delivered to each member at least ten days prior to the date of the meeting. At this meeting there shall be elected nine directors. The so elected shall form a Board, and shall serve until their successors are elected and installed. Any vacancy occurring during the year shall be filled at the next meeting, provided it is so stated in the notice calling such meeting. Any member in good standing except student members shall be eligible to hold any office in the society.

15. General meetings of the society may be called at any time by the Secretary upon the instructions of the President or Board with "Proper Notification" of each member at least ten days prior to the date of such meeting. A special meeting shall be called by the President or Secretary upon receipt by him / her of a petition signed by one-third of the members in good standing setting forth the reasons for calling such meeting, notice of which shall be by letter to the last known address of each member, delivered in the mail ten days prior to the meeting.

16. Twenty members in good standing shall constitute a quorum at any meeting.

VOTING

17. Any voting member in good standing shall have the right to vote at any meeting of the society. Such votes must be made in person or by proxy.

REMUNERATION

18. Unless authorized at any meeting and after notice for same shall have been given, no officer or member of the association shall receive any remuneration for his services.

BORROWING POWERS

19. For the purpose of carrying out its objects, the society may borrow or raise or secure the payment of money in such manner as it thinks fit, and in particular by the issue of debentures, but this power shall be exercised only under the authority of the society, and in no case shall debentures be issued without the sanction of a special resolution of the society.

BY-LAWS

20. The By-Laws may be rescinded, altered or added to by a "Special Resolution".

Definition:

"Proper Notification" - Proper Notification shall be defined as Notification delivered by electronic means such as email, or if the person does not have email, in writing via postal service or fax.

DATED this 31st day of March 1994

REVISED this 9th day of February 2002