



# The Challenge

THE NEWSLETTER OF THE WESTERN CANADA GROUP OF CHARTERED ENGINEERS

## Message from the Chairman



The Summer of Year 2009 is with us, less than one year away from the Winter Olympics. Once again we had a successful Annual General Meeting and dinner event at the Royal Vancouver Yacht Club. This time however, we deviated from the usual in that we had a Guest Speaker rather than the dance program.

**Brian Douglas**, CEO of Olympic Broadcast Services Vancouver, who was head of production for the Torino and 2002 Salt Lake City Winter Games, brought us up to date on progress of the broadcasting coverage for the 2010 Winter Olympics. He gave a fast paced presentation with stunning pictures. An eager question and answer session ensued. This was followed by some mind games befitting of the brain power at our various tables which demonstrated the skills of many engineers and their spouses as code breakers and solvers of puzzles.

In taking over as Chair I must thank both of the previous Chairpersons for setting us on the path of Sustainability. **Wilma Leung** introduced the Sustainability Theme in the 2008 year and **David Harvey** carried it on into 2009. Our Guest Speakers continued along this Theme. **Kevin Tagg**, brought us up to date on progress on the new Canada Line Rapid Transit System. **Rachel Bolongaro** spoke to us on the subject of Geo-Exchange. At this point in time, it is a fact that fossil fuels are being depleted at an ever increasing rate and as Rachel pointed out, we must turn to alternate sources in order to maintain our standard of living. We have two enormous alternate sources of usable heat and it

was her contention that we must use them in our future designs. The two sources of course are the earth and the water, and her presentation showed us methods by which we could extract this energy. Complimenting this topic was **Professor Robert Evans** whose presentation dealt with Fueling our Future. Here he was discussing the potential for alternate power sources in the Province, primarily electricity.

As your Chair, I will continue to promote the Sustainability Theme.

Wilma Leung is continuing to present us with updates on the Convention being sponsored by ICE in 2010.

Our thanks to **Arul Raja** for his long time work as the Membership Coordinator and the Program Developer. We are grateful to his daughter **Nalini McIntosh** for arranging Brian Douglas's excellent presentation at our AGM.

We were saddened to hear of the death of one of the founding members of WCGCE, **Jim Gordon, FIMechE, IMechE**. Our condolences to his family on their loss.

*Dick Perry*

## In this issue

- Message from the Chairman
- Message from the Editor
- Technical Program Notes
- Jim Gordon—a Tribute
- Current Activities
- Upcoming Events
- 2009 Committee

**Message from the Editor**

I would like to thank everyone who has contributed reports on our technical meetings and other activities.

If you wish to contribute a report on a technical event, an article or an announcement, please contact me; my contact details are listed below.

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**Technical Program Notes**

**Geoexchange Systems**

**February 18th, 2009**

The speaker was Rachel Bolongaro P.Eng, who gave a well illustrated presentation on Geoexchange Systems to provide heating or cooling in residential and commercial buildings. The geoexchange system is the new name for ground source heat pumps which use the ground or a water sources to provide low grade heat or provide a heat sink for cooling purposes.

She outlined how such a system operates, similarly to a refrigerator, but with a reversing valve which allows it to move heat either into the building or out of the building. The advantage of the ground source over air is that the ground is at a pretty constant temperature year round and in the Vancouver area is at about 10C or 50F.

Tapping into this heat source is achieved by drilling holes to varying depths and spacing depending on the geotechnical report on the site. A flow



Buried piping for external heat exchange

of subterranean water is an excellent source and water wells can often serve a double purpose of drinking or irrigation water and a heat source/sink for the Geoexchange system. In some instances coils of plastic pipe can be buried in a shallow

trench or lake and will provide the necessary heat source. A water antifreeze solution is used to circulate between the heat pump and the heat source. Polypropylene is the antifreeze of choice as it is non toxic.

Rachel gave a number of examples of installations that have been recently installed, from a multimillion dollar condominium complex to small com-

mercial buildings. She pointed out that the COP of a typical heat pump is about 3 to 4 and this means that for every kW of electricity used 3 to 4 kW of heat is either provided to the house or some 2 to 3 kW of heat is rejected. The installation cost of the project will depend on terrain and the available land available to access. Cost of drilling can also be expensive in certain types of ground.

We had a very good turnout (60+ members and guests) there were many questions and a lively discussion on the subject.

David Harvey on behalf of the Group thanked the speaker for a very interesting and thought provoking talk and presented her with a token of our appreciation.

*Report by Bob Martin*

**Fueling Our Future— An Introduction to Sustainable Energy**

**March 25th 18th, 2009**



Prof. Robert Evans

The speaker was Professor Robert Evans, FIMechE, C.Eng., who gave a well illustrated presentation on "Fuelling our Future; An Introduction to Sustainable Energy" This is also the title of his recent book on the subject.

Professor Evans used a well illustrated Power Point presentation to outline the role played by oil, coal and natural gas, which are the primary sources of energy in B.C and also contribute to CO2 levels and global warming. He illustrated where all the energy is used in today's industry, commerce and home, and that the net energy actually used for useful work is only just over 50%. The largest allocation of this is used to power transportation. He then went on to discuss some renewable energy sources and pointed out that B.C. is fortunate in having a large percentage of the provinces electrical supply being provided by hydro sources.

He discussed wind power and solar. He also discussed the use of hybrid technology in the vehicle industry and the application in vehicles like the Toyota Prius. The ongoing ability for such vehicles to also charge up their batteries overnight will also reduce the CO2 in BC with the use of hydro or the more efficient combustion in fuel fired stations as a non peak source of electricity.

He emphasized that the production of Hydrogen using electricity (fuel cells) is not the most effi-

cient use due to losses in the production and application in a fuel cell. The direct application of electricity to charge a battery is much better.

Dr. Evans answered many questions during and after his presentation.

We had a good turnout (40+ members and guests) there were many questions and a lively discussion on the subject.

Dr. Evans was thanked on behalf of the group for a very interesting and thought provoking talk by the Hon Sec Bob Martin who has known and discussed energy application with him over the past many years.

James Canova presented him with a token of our appreciation.

*Report by Bob Martin*

### **Odyssey to the Southern Hemisphere**

**February 18th, 2009**

The speaker was Bob Martin, P.Eng, MIMechE, and Hon Sec for the Group, who made a presentation on a recent trip to South America. He used a Power Point presentation to outline some of the key areas he visited in January and February of this year, these being Machu Picchu in Peru, Antarctica, and Iguazu Falls in Brazil. This was followed by a video of these three areas showing the magnificent scenery and historical structures.



**Machu Picchu**

Machu Picchu was constructed sometime in mid 1400 and was abandoned about the time the Spaniard Conquistadors conquered Peru. The Spaniards never did find the site. The reason for building a town of some 1000 inhabitants on a narrow mountain ridge in a remote area of the Andes is still a point of discussion. The two main theories are it was either as a summer retreat for the Inca Emperor or a religious and astronomical retreat.

The town was constructed with multiple terraces to stabilize the earthquake and rainy area. These terraces provided the agricultural land for crops. It was not until the 1920's that Archeologist Hiram Bingham was shown the site and made it known to the world. The water distribution system still works and the drainage of the site is so good that puddles are never seen even after heavy rain. The amazing thing about the site is the fine stone work that was used in the building was done using

stone-age tools as the Incas had not any metal tools.



**Wendal Peak in Lemaire Channel — Antarctica**

The next area on the visit was Antarctica where the ship cruised the straits and bays of the Antarctic Peninsula. This area of Antarctica has experienced global warming and the breakup of some of the massive ice sheets had been in the

news just the morning of the presentation. The size of the ice sheets are massive when you consider that one is larger than Spain.

The ship got further south than other large cruise ship to 65degrees south latitude just one degree from the Antarctic circle. Many glaciers and ice sheets were seen as well as animal life such as penguins, whales, leopard seals, and sea birds. The passengers experienced cold weather with snow on the first day but enjoyed sunny weather on the next which really allowed the scenery to be seen.

The last area was Iguazu Falls which are located on the border of Brazil and Argentina. There are some 275 falls or cascades of various sizes spread over a 2 mile line where an ancient rift changed the elevations of the area. The main fall called the Devil's Throat or Devil's Cauldron is higher than Niagara Falls. The best viewing is from the Brazilian side but the larger area of the park is on the Argentinean side, however to see both sides you require to have the necessary visas and passport to cross the border. The water flow varies with the rainfall and there had been some rain just prior to our visit so the falls provided a good show. The nearby Iatapu Hydro plant generates some 12,600 megawatts of power from the river flow which is about 40% of the Brazilian and Argentinean power needs.

We had a reasonable turn out of 25 members and guests, and they expressed their appreciation for the presentation. After, there were many questions and a lively discussion on the areas seen.

Bob was thanked on behalf of the group for a very interesting and thought provoking talk by David Harvey.

James Canova presented him with a token of our appreciation.

*Bob Martin*

## James Chalmers Gordon

August 23, 1928 – March 20, 2009



It is with great sadness, we announce the passing of one of our founding and most illustrious members of the Western Canada Group of Chartered Engineers, James Chalmers Gordon, FEIC, FIMechE.

Jim was born in Newcastle-upon-Tyne on August 23, 1928 and passed away on March 20, 2009 in Vancouver, BC after a brief but valiant battle with cancer. He is survived by his wife of 52 loving years, Sheila (nee Walton), his daughter Julia (Jon), son Aidan (Jackie), and his beloved grandchildren Joshua, Sara and Angus.

He was one of those rare engineers who started on the shop floor and worked his way up to professional status juggling a full time job, family and night school to achieve a Higher National Certificate in Engineering. This explains his special attention and support for the BCIT Mechanical Engineering in later life where others might have endowed a local university. He went on to become CEO of his own company and make his mark in so many other ways.

For many years Jim Gordon, had been the official representative and corresponding member for the IMechE in Western Canada, which included the prairie group in Calgary. As is happening now, the membership of each of the branches was shrinking and discussions were held with the ICE and IEE to have joint meetings. In July 1987 the Western Canada Group of Chartered Engineers (WCGCE) Constitution was drafted and submitted to London. Jim, and Maurice Favell, who was the first chair for the WCGCE, were active in the initiation of the group. Jim arranged many visits of IMechE Presidents and Directors to Vancouver, latterly with the assistance of Bob Martin who has taken on Jim's role as IMechE Rep.

Jim also administered the Commander Terry Award, which was a book award (Mark's Standard Handbook for Mechanical Engineers) to a student at BCIT. This award will be continuing.

In addition to the WCGCE, Jim played pivotal roles in the EIC, CSSE and CSEM.

In the community, Jim was a stalwart member of the Oakridge United Church, Past President and

Past Treasurer of The Fair Haven United Church Homes in Vancouver and Burnaby and Past President of The Royal Arch Masonic Home.

His dedication to the many charitable, fraternal and community interests was surpassed only by his dedication to the love of his life, Sheila, his children and grandchildren, and his grand-dog, Rocky (who always got a cookie!). His extraordinary sense of humour and wonderful stories will be greatly missed at the Sunday family dinner table.

Jim embodied the power of positive thinking in every aspect of his life.

Memorial services and celebrations of Jim's magnificent life were held at the Oakridge United Church and at the Gizeh Shrine Centre in Burnaby, BC.

For those who wish to honour Jim's outstanding contribution to society, the James C. Gordon Memorial Fund has been established at BCIT. Cheques payable to the BCIT Foundation may be sent to The Foundation, 3700 Willingdon Ave, Burnaby, BC V5G 3H2, appropriately identified. Donations can also be made on line at [www.bcit.ca/foundation](http://www.bcit.ca/foundation) and click on "Donate Today".

## Current Activities

### The 2009 AGM and Dinner Event

Our Annual General Meeting took place on Saturday January 10<sup>th</sup> 2009 at the Royal Vancouver Yacht Club. This was followed by a very enjoyable dinner party.

This year instead of our usual dance, a guest speaker was featured. See **Covering the Olympic Action** which follows.

This was followed by some mind games befitting of the brain power at our various tables which demonstrated the skills of many engineers and their spouses as code breakers and solvers of puzzles.

Our thanks to Alan Kay for organizing this.

*Chris Richardson*

## Covering the Olympic Action



**Brian Douglas  
Presents**

Brian Douglas, CEO of Olympic Broadcast Services Vancouver, gave the presentation assisted by Nalini McIntosh, his Head of Human Resources. Brian, who was head of production for the Torino and 2002 Salt Lake City Winter Games, brought us up to date on progress towards broadcasting coverage for the 2010 Winter Olympics. He gave us a fascinating behind the scenes view of all that went on to bring this about.

A team of specialists had to be hired and trained. All the Olympic venues had to be analyzed to decide the equipment needed and the strategy used to cover every aspect and every possible view of



**Men's & Ladies  
Downhill Courses**

of the courses, of the events and of the competitors. This equipment had to be ordered and set up in the best possible locations. Cabling and platforms had to be set up in the summer to withstand unpredictable winter levels of snow and to cope with varying visibility. Gyro stabilized cameras were to be used on helicopters, weather permitting. Cameras were also to be incorporated in competitors helmets. Backup systems had to be in place to adapt to the weather, equipment failure, and possible infrastructure damage from shifting snow damaging winter-buried cabling.

The camera feeds will go to the world so every competitor has to be assured equal quality coverage to be fed to their viewers back home.

The feeds had to be compatible with the television systems of the entire world, with staff in place to service the reporters of the world such that their rapidly ranging choice of those same live feeds went out to their country accompanied by commentary in their language showing their competitors in the best possible light without favour.

The operation is to run 24/7 so countries whose time lags our own can wake up to exciting action from the same choice of feeds (rerun) while Canada sleeps.

A lively question and answer session followed.

*Chris Richardson*

## Upcoming Events

### Inspection of the Phonebox

The inspection of the phone box will take place on

**Saturday July 25th 2009**

**at:**

2414 Treetop Lane,  
North Vancouver, BC

**SEE ENCLOSED FLYER**



### ANNUAL FIELD TRIP

**September 2009**

A trip to Vancouver Island to reconnect with our Island members

Arrangements were not finalized at press time, but members will be notified by mail and if on our list, by email.

### Bio-Transportation Fuels and Bio-Products

**Speaker:** Chris G. Scott-Kerr, PEng, Amec Americas Ltd.

**DATE:** Wednesday 27 May 2009

**TIME:** 7:00 pm

**PLACE:** Holiday Inn, Metrotown,  
Burnaby

British Columbia provides slightly less than half of Canada's wood harvest. A goodly portion of this remains wasting in the forest.

A number of emerging technologies promise to utilize this as transportation fuels and other currently petroleum derived products. These technologies provide hope for the struggling forest industry, potential for carbon capture, sale of carbon credits and reduction in the use of fossil fuels.

This would create new industry with BC and assist Canada to meet its Kyoto commitment. (source: CSSE notice)