



The Challenge

THE NEWSLETTER OF THE WESTERN CANADA GROUP OF CHARTERED ENGINEERS

Message from the Chairman



The past semester brought an interesting crop of events and I trust that our members and friends were pleased with the excellent technical presentations organized by your Committee. Read more inside.....

The WCGCE was honoured to host the **ICE Americas Convention 2010** locally in Richmond during the first weekend on June, with theme: **Engineers in the Heart of Society: Collaborations and Innovations**. By all accounts this event produced an outstanding array of speakers and papers, emphasizing the crucial role of Engineers and the embedded opportunities for them in environmental and climatic aspects of human activity.

The ICE elected a new President recently, **Mr. Peter Hansford** who concluded in his remarkable address (quote) "Reducing carbon, on the scale demanded, is a huge challenge for us all. The Victorian engineers, our eminent predecessors, are remembered for their legacy in creating the infrastructure of this country, and indeed the infrastructure of many parts of the world. Let our generation's legacy be the low carbon infrastructure we create in the first half of the 21st century."

Our traditional July-social event (barbeque) followed a fresh format – on invitation from the *Sea-To-Sky Branch of APEGBC* our Group joined them in a convivial and delightfully organized garden

barbeque one sunny afternoon. Some members got carried away with inspection of the engineering attributes of the Fish pond, Gazebo and water way hydraulics in the sprawling hill side garden! Our guests of honour were the President of IStructE, **Mr. Norman Train** and his wife Wanda, who were on a presidential visit from London. Mr. Train attended part our Committee Meeting and valuable ideas were exchanged. He outlined the IStructE strategic initiatives underway in India, China and the Gulf States, and the inauguration of the new Ontario Division, the second in Canada after us of the west coast provinces.

Also among the guest were past presidents of APEGBC and a few local MLAs.

The house is in order as far as the state of the Group's finances is concerned. The submitted budget for 2011 exceeds the previous by 18%. Our Treasurer **Andrzej Nawrocki (Elec)** guards efficiently to keep our wheels turning. Good job Andrzej!

Our Strategic Planning review was completed in November under guidance of **David Harvey**

In this issue

- Message from the Chairman
- Message from the Editor
- Technical Program Notes
- Current Activities
- Upcoming Events
- 2010 Committee

(Struct) and the Advisory document is expected to be tabled at the AGM in January 2011. At the core of the planning lays the realization of the day that Members no longer ask 'what can I bring to my Institution?' but 'What does the Institution have for me?' I am excited that the six Strategic Objectives being advanced will guide the Committee to reach and serve all potential members as visualized. Two key strengths of the WCGCE, which are unmatched by others vying for the attention of individual engineers are: our international base and links, and our inclusive interdisciplinary grouping.

Our modernized website is regularly refreshed with news and event-clips by committee member **Tim Mah (Elec)**. This facility is a vital factor in our Strategic Plan and is not exhausted by any stretch. The website is proving an effective tool for members and the public to follow our activities and forthcoming events, or to log directly in to the various Institution portals which make up our Group. Please make use and give your opinion and suggestions!

James Canova (Mech) and **Lisa Brown (Civil)** are looking in to the viability of presenting our regular evening events by webinar technology; we are excited to exploit this tool for the benefit of our regional members out of town. Trials are underwaya little more patience!

On a personal note about your Committee, **Bob Martin (Mech)**, the Honorary Secretary informed us that he had received a certificate from IMechE congratulating him on being a member for 50 years. We congratulated Bob on this remarkable milestone. Between the lines, it reflects his outstanding service to his Institution and to the WCGCE, and we are honoured to confirm. For those who work with Bob, he is as efficient as ever!

On behalf of the Committee, I am pleased to wish our members a pleasant festive season and look forward with you towards exciting events and opportunities in 2011.

George de Ridder

Message from the Editor

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

Members should know to refer to our web site www.wcgce.org managed by **Tim Ma** for current activities and to see back issues of the Challenge.

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

Chris Richardson, C.Eng., MIET.

email: editor@wcgce.org tel: (604) 879-9980

Technical Program Notes

Alternative Energy – The Challenges

June 16th, 2010

The technical part of the meeting was a presentation by **Bob Martin, P.Eng, MIMechE**, and Honorary Secretary for the Group on the subject of Alternative Energy – The Challenges. The speaker was introduced by James Canova and the talk was a Power Point presentation which covered Hydro, Wind, Solar, Wave and Tidal, Geothermal and Bio fuels.

The speaker started with outlining the current energy mix noting that Oil Coal and Natural Gas are the dominant players and that renewable energy sources are in total a small percentage of the whole.

Because Oil provides a lot of energy in an easily used and transported package at a relatively low price, the alternatives must try to match this with recognizable benefits. The major one of course is that none produce CO2 except Bio Fuels, and growing Bio Fuels capture the gas.

Bob outlined the increase in Run of River hydro plants in the province which is richly endowed with many suitable rivers. He noted that unlike a major hydro dam the smaller plants do not provide large barriers for fish nor flood large areas. However they have their own problems with little or no power generation during years of drought. They also re-

quire permits from some 50 agencies including local authorities, First Nations, provincial governments, and for installation larger than 50MW, the federal government.



Wind Turbines in California

These considerations also apply to Wind generation which is seeing increasing use in the Northern region of the province. The major challenge for wind generation is the huge variation in wind velocity from too much to none. Windy sites

are often located far from major population centres and require long and expensive power transmission corridors. Because of its intermittent nature, the typical wind turbine only produces power about 16 to 20% of the time so there has to be a backup supply to carry the demand during times of little wind which B.C. has an advantage with the large Hydro facilities

Solar energy is somewhat limited in B.C. because of its northern location and the major population centre of Greater Vancouver is subjected to frequent Pacific storms during the winter. Bob noted that one of the best matched applications for solar heating is outdoor swimming pools which are used when we get the most sun. He showed various methods of capturing Solar energy including water heating panels, photo voltaic panels and Power Towers where a multiplicity of mirrors shine on a central tower producing steam to generate electricity at a conversion rate of about 35% .

One item of note was that some researchers have come up with a prototype PV panel with an 85% efficiency to convert the sun's rays to electricity. This is a major advance as the typical PV panel has only a 15% average conversion.



Pelamis Sea Snake harnesses wave power

B.C. is richly supplied with sites that would be suitable for Tidal Generation and Wave Power units. The speaker outlined some of the progress in this field, mainly in Scotland, and

noted that water has a density some 800 times that of air although the flow rate is much less. Thus overall the units can be much smaller. The sea is a highly corrosive element and the massive power of storms is always a threat to installations, so maintenance is difficult. At present no installations seem to be planned in B.C..

Bob noted the problem with Bio Fuels is that they also compete with food crops and the energy required to grow and harvest material often equals the energy they produce as fuels. Until non food material is more easily converted to ethanol their real advantage is questionable .

He noted that Algae is an up and coming area for a source of either ethanol or bio diesel.

In the Geothermal area there is very little activity, for although we have many sources of hot springs the experience to date is that any wells drilled in those areas have resulted in very little power being produced.

Bob answered some question from the audience of 25 members and guests and was thanked by the chairman for a very informative and interesting talk.

Bob Martin

Vancouver Island—Camosun College

September 25th, 2010

The September 25th Field Trip to Victoria was to visit to the **Mechanical Engineering Technology department** of **Vancouver Island Centre of Advanced Manufacturing & Prototyping** at **Camosun College**. Our tour guide was **Ross Lyle Dip Tech, BEng, PEng**, the program director and Department Head.

Camosun College provides a variety of engineering technicians programs, and also Bridge courses in co-operation with the University of Victoria leading to entry at the third year of a Bachelor of Engineering degree there for successful graduate Mechanical Engineering

Technologists.



Ross Lyle with a Sterling Engine

Our tour started in the Machine Shop where as well as the machine tools, some completed student projects - a home built Sterling engine and various robot devices, were exhibited.

We then visited the Automation Lab which services two electronic courses and three Automation courses. We saw a Rapid Prototyping machine, which could do fused deposit modeling using APS plastic in three dimensions, a Laser Cutter which is used to cut plastic cork, wood or metal using IR laser and airjet, a water jet cutter and a five axis machine tool with a 20,000 rpm cutting tool with a 1.2 X 3.6 X 1.8m. bed

The Materials Lab contained various tensile testing machines, a five axis waterjet machine tool with a



Digital waterjet cutting Machine

60,000psi water jet capable of cutting aluminum, plastic, steel, granite and glass. The head was fine garnet. We also saw scan imaging machines, able to scan an object which could then be reproduced using a digitally controlled deposit modeling machine, or a digital cutting machine.

The tour wound up with a brief visit to the their plumbing engineering and solar technology laboratories. Here they had solar receptors (for water heating) and complete piping systems assembled for measurement, experimentation and analysis.

Lunch was at the Waddling Dog, This was followed by a trip home on the ferry for mainland members. We were treated to a view of a pod of killer whales just outside Active Pass on the way home. A very interesting and enjoyable day. We are grateful for the efforts of James Canova for organizing it, and Ross Lyle for conducting to tour.



Orcas in the Georgia Strait

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Chris Richardson

Neighbourhood Energy Utility

October 19th 2010 at 7:00pm.

The speaker for the evening was **Gary Killaky, I.Eng**, Chief Engineer for the Neighborhood Energy Utility (NEU) for the City of Vancouver. The project is located at the Southeast corner of False Creek and was constructed to operate for the Winter Olympics held in Vancouver in February 2010.

The unit is a district heating system using a combination of heat recovery from local city raw sewer mains and with gas fired boilers for boosting and backup. The system is environmentally friendly and obtained a Gold LEED award for the facility. The system provides hot water heating and domestic water heating as well as air conditioning ability for the existing building and future buildings planned for the site.

The water is circulated at between 65 and 95C in piping which has a built-in insulation jacket suitable for direct burial. The peak load is some 11MW. The projected electrical consumption is 25,000MWh/year.

The system is located in a purposely designed building under the Cambie Street Bridge and only the 5 vent stacks for the gas boilers can be seen from the bridge. These vents are designed as fingers of a hand and have LED coloured lighting continuously indicating the system efficiency which is used in an informative or decorative way.



False Creek Neighbourhood Energy Centre

There is a large heat recovery heat pump facility with a coefficient of performance (COP) of 3.5, making use of the heat energy contained in the major sewer line running through the site. The sewage is led into two large sumps which contain self cleaning screens to allow only the fluid from the line to be passed through the heat pumps.

The system has enabled some 70% of the space and domestic water heating demand to be pro-

vided from recovered energy up to this time. However a full year has not yet been experienced. The balance of the heating is provided by 3 natural gas fired boilers, consisting of two 4 MW and one 8 MW units, operating as needed.

Additional energy is obtained from some Solar panels on some of the building. The system is claimed to reduce greenhouse gas emissions by 30% relative to a totally gas fired system. The total cost of the system was \$36 million.

Gary showed a power point presentation illustrating the construction of the project and discussed some of the challenges they faced during the installation and its initial operation.

He was thanked for his informative and interesting talk and the chairman presented him with a token of our appreciation. Some 20 members and guests asked a number of questions on the project.

Bob Martin

Current Activities

The WCGCE Annual BBQ

The group met with other engineers and guests who were part of the Sea to Sky Branch of **The Association of Professional Engineers and Geoscientists of British Columbia (APEGBC)** at the residence of APEGBC member Bill Vaughn.

Also in attendance were the **IStruct President Norman Train**, 2 members of the Provincial Legislature and 4 past presidents of APEGBC who joined everyone for an enjoyable meal with a wide variety of meats, vegetables and fruit.



Host Bill Vaughn (left) presents Dick Perry a draw prize

The visit finished about 8:00 pm after a prize draw where 2 of our members won prizes. The WCGCE wishes to thank

Bill Vaughn and **APEGBC President Horst Junger** for their generous hospitality.

Chris Richardson

IStructE President's Visit

A group of local IStructE members met up with the **2010 IStructE President, Norman Train**, when he visited Vancouver last July, and exchanged information on what is happening in structural engineering circles around the world. It was a most enjoyable occasion, and maintained the quality of the presidential visits we have enjoyed in recent years.

While in Vancouver, Norman toured some of Vancouver's flagship projects, starting with the



Norman Train (left) with Paul Fast

Richmond Oval where the Oval roof designer, **Paul Fast** explained how the award-winning, record-breaking timber span was built. Norman also visited the Canada Line Operations and Maintenance Centre where

Grant Bailey, Protrans BC Director, described the huge success of the first airport-to-city-centre transit project in Canada.

During the visit, Norman and his wife Wanda, also attended the WCGCE Annual BBQ which



Norman Train (5th from left) meets the WCGCE Committee. Past IStruct President David Harvey and WCGCE Chairman George DeRidder on his left.

was held in conjunction with the APEGBC Sea-to-Sky Branch for the first time this year.

Before the BBQ, the WCGCE Committee held a meeting which Norman attended – a first for a president of a sponsoring institution. Norman took the time to describe to the Committee his recent activities on behalf of IStructE, and the goals which he had set for his presidential year.

Following the BBQ I took our visitors to Whistler where we toured the village and rode the Peak2Peak gondola.

Following the visit, Norman and I headed to London for IStructE's annual assembly which included meetings of the Executive Board and Council, along with the AGM. This year the event was held aboard HMS Belfast, a Second World War cruiser, now permanently anchored in the River Thames near Tower Bridge. The unique location, combined with a colourful mix of delegates from across the world, made for some interesting and very useful discussions, and some valuable international business was conducted.



HMS Belfast

Norman Train is a colourful character, who is known for flamboyant neckware and a unique signature in the image of a locomotive. Norman's mission is to represent the small practitioner in an era in which engineering business is fast becoming the domain of multi-national firms; and to champion the cause of sustainable engineering.

We were delighted to host the presidential visitors who thoroughly enjoyed their visit to Vancouver. Both Norman and Wanda were most impressed with our city and the professional activities we undertake.

As previous presidents have noted, Norman liked the fact that the individual institutions work well together under the WCGCE umbrella. We look forward to future presidential visits which are always interesting.

David Harvey—IStruct Representative

David Harvey—IStruct Representative

Vancouver Hosts 2nd ICE Americas Convention



Wilma Leung

Wilma Leung, ICE Representative for Western Canada, together with **David Harvey**, **Alan Kay** and others on the WCGCE Committee, hosted the **Second ICE Americas Convention** between 3rd and 6th June 2010.

Held in Vancouver, British Columbia, the Convention included a technical conference under the theme **Engineers @ the Heart of Society: collaborating + innovating for Our Common Future**, an ICE Business Day attended by Representatives from across the Americas and a site visit to the Richmond Olympic Oval building.



ICE Americas Conventioneers in front of the Richmond Olympic Oval

The Convention was a great success and followed-on from the first Americas Convention in Las Vegas in 2008, with the Vancouver conference day attracting approximately 80 delegates from a wide range of engineering disciplines and including an excellent set of thought-provoking speakers.

These included **Keith Clarke**, who presented the 8th Brunel International Lecture at the event. In order to disseminate the presentations to a wider audience video recordings of the presentations from the conference are already uploaded on www.ICE-AmericasConvention2010.weebly.com

[Despite the time that has elapsed since the convention, the number of visitors viewing the recordings on the website is still going very strong.]

The conference also allowed for wider engagement by ICE with the engineering community in Canada, with representatives from the **Canadian Society for Civil Engineering** and **Engineers without Borders Canada** in attendance. As well as raising the profile of ICE within Western Canada, the convention also provided valuable input into ICE strategy for the region.

With 11 representatives in attendance at the convention and the ICE Business Day, from Canada,

the US, the Caribbean, Panama and Brazil, discussions included a focus upon initiatives to develop and strengthen ICE's profile across the Americas. Also to further develop engagement with sister institutions, as well as considering issues of mutual recognition between the UK and North America, and further engagement with Brazil as a means of expanding within Latin America. These discussions will now be developed further via the Americas Subcommittee in order to be incorporated into ICE strategy for the region.



Visiting ICE President Paul Jowitt (centre) with David Harvey and George De Ridder (right)

After the convention, to thank them for their support, the ICE Convention Committee entertained the WCGCE committee to supper at Queen Elizabeth Park. A wonderful evening was had by all.

Many thanks are due to the WCGCE committee for all their hard work assisting in the organizing of the Convention and for making it such a great success. Thanks go also to David Caiden for arranging Arup sponsorship and the strong engagement of the ICE New York committee with the event.

Thanks also to Neil Bailey (ICE Area Manager, Middle East, Americas and Africa) for his sterling effort in coordinating this event from London.

Wilma Leung

Upcoming Events

AGM AND DINNER EVENT

The Annual General Meeting will take place at the **Royal Vancouver Yacht Club**.

Date: Saturday 29th January 2011

Time: 5:45pm

The **Dinner** will follow at 7pm.

Guest and spouses of members attending the AGM may join an informal reception prior to another enjoyable evening of excellent food, interest, entertainment and fun .

Contact **Alan Kay** for tickets at 604-922-6150 or

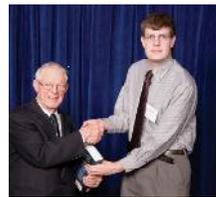
alan.akay@shaw.ca

-SEE ENCLOSED FLYER

Other Business

The Commander S M Terry Award

Congratulations are due to **Spencer Hadden** , a graduate of **BCIT Mechanical Engineering Program**, seen below (right), being presented the **Commander S M Terry Award for 2010** by IMechE Rep. and WCGCE Hon. Sec. **Bob Martin**.



The Book Prize (Marks Handbook for Mechanical Engineers) is presented by the **Institution of Mechanical Engineers** annually to the top Student in Mech. Engineering Design on the recommendation of the faculty at BCIT.

WCGCE Awards

Congratulations are due to the following third and fourth year **UBC** students who are recipients of the **WCGCE awards for 2010**:

Ms. Jacqueline Gutjahr: Vancouver, BC
(Civil Engineering)

Mr. Alexey Pazukha: Burnaby, BC
(Electrical Engineering)

Mr. Alim Jiwa: Burnaby, BC
(Mechanical Engineering)

Ms. Megan Hodder: Victoria BC
(Chemical Engineering)