



The Challenge

THE NEWSLETTER OF THE WESTERN CANADA GROUP OF CHARTERED ENGINEERS

Message from the Chairman



The recent winter semester included regular technical meetings and monthly presentation, offering a variety of excellent topics from architecture, to medical isotopes, to bio-fuels. In the coming months, your Committee plans to present topics related to engineering including management and human sciences. Read more about our technical meetings on the website (www.wcgce.org) and look out for email notices. Members may also receive hard copies by requesting mail notification. We encourage our members to suggest topics and speakers for consideration by the Committees. Despite the excellent speakers and topics on offer, our average event attendance is only 15 members plus the committee. With a potential audience of 600, there is clearly room for improvement.

Our website is due for a facelift, and I invite your suggestions. The website is the face of our organization and should reflect the high caliber and diversity of its members. **Tim Ma (IET)** diligently manages on our behalf, and would welcome your feedback.

After in-depth assessment and a trial run with web-based live broadcasting of events, your Committee have decided not to implement this medium yet, primarily due to high cost of web linking at our preferred venues. We also concluded that **Twitter** and **Facebook** accounts are not

viable. However, we are continuing to work on recording and archiving our technical presentations—look out for a future announcement on trial recordings.

Pursuing the other strategic objective adopted in 2011, our sub-committee on outreach to young professionals and students has made good progress. Under the championship of **Allan Kay**, informational material about Chartered membership is now ready, and we are currently engaged in discussions with local student organizations. Our aim is to inform, encourage and guide future engineers and engineers in training towards ownership of a highly regarded international title **Chartered Engineer**. This initiative presents an excellent opportunity for guidance and mentorship by our members, those looking for CPD opportunities—please note!

The Finances of the Group are in good standing although we are heavily dependent on grants from the London headquarters of our sponsoring institutions. The current budget is running to plan thanks to the diligent of our event organizers

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and the honorary Chairman, **Andrzej Nawrocki (MIEE)**. As members have noticed recent, the Committee strongly encouraged the use of email communication instead of regular mail which will reduce the expenses and promote “green” practices. Kindly notify us to changes to email and street address to keep in touch with you-use adminmail@wgcce.org for notifications.

After editing and producing numerous editions of this newsletter, **Chris Richardson, (IET)** handed the reins to **Dick Perry (CIBSE)** as Editor. Chris has worked hard, was on time, and always met our expectations. I wish to thank Chris heartily for the excellent job he carried out on our behalf, and also to acknowledge the other newsletter contributors. Our members can look to continue good services under Dick’s experienced guidance.

It is a privileged and pleasure to chair your Committee, an outstanding team who continue to serve the Group unselfishly. As the AGM elections in January did not proceed new faces, your Committee comprises many stalwarts, some with decades of sterling service to the Group. The position of **Honorary Secretary (Bob Martin)** and the **Honorary Treasury (Andrzej Nawrocki)** will become vacant in 2013. Please be aware of the imminent need to replenish the Committee in order to sustain vital services and generate growth. To assist in sustaining our functions, we plan to amend the constitution . The proposed amendments are subject to membership approval at the 2013 AGM, and acceptance by our sponsoring constitution.

I wish to encourage our members to take an interest in our programs and committee affairs, and to consider standing for election in 2013. Professional services can be immensely satisfying. Please help us reinvest in the wonderful profession that sustains us all.

Sincerely,

George De Ridder FIStructE

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.wgcce.org**, managed by **Tim Ma** for current activities and to see back issues of the Challenge.

Challenge is available by e-mail in pdf format

Just e-mail **Editor** to receive it this way in the future and save on printing and postage.

*Richard Perry, C.Eng. F.I.Mech.E F.C.I.B.S.E.
email: editor@wgcce.org tel: (604) 731-1402*

Technical Program Notes



B.C.Hydro Site ‘C’ Clean Energy Project

February 15th, 2012

The speaker for the evening was Susan Yurcovich Executive Vice President for the B.C.Hydro Site ‘C’ Clean Energy Project, which is a major project to be built downstream of the two existing dams on the Peace River in Northern B.C. Assisting Susan was John Nunn, Chief Engineer for the project, who is with Klohn Crippen Berger Ltd, who discussed the technical aspects of the project.

The review of the environmental and engineering is already underway and has used much of the earlier work which was completed in the early 1980’s when Hydro first applied to build the project. At that time and in a subsequent application in the 1990’s they were turned down on the basis that the province did not require the power at that time. It would appear that the approval

authority did not fully realize the rapidity at which the province would grow or the time required to complete approvals and build the dam and the power station.

The project is some 83km downstream of the Peace Canyon dam and the river reservoir will run from the dam almost to the Peace Canyon project, and be 5,300 hectares in area. The dam will be an earth filled with the Power House and spillways in line with the river flow to minimize the instability of the ground conditions at the site. The turbines will be fed from two sets of intakes and the overflow spillway will be designed to minimize erosion by the water flow during excess spilling from the reservoir. The project will generate some 1100 Megawatts and 5,100 GWH /year, which is about the power used by 450,000 homes. The power is about 35% of that produced by the turbines at the WAC Bennett dam and only uses 5% of the reservoir area, as the project is essentially a run-of-river and re-uses the water that has already generated power at the two upstream sites. The cost to complete the project is estimated at about \$8 billion which would produce a cost per megawatt-hour at between \$87 and \$95, making it one of the most cost effective new power generators. One of the criticisms of the project is the amount of Green House Gas (GHG) emissions that it would generate from the removal of some of the forest during construction. This is estimated at 5.1 million tonnes over the 100 year life span and includes 1.1 million tonnes during the construction phase or only 4.0 million during its operating life. Much of the current and near future discussions will be with land owners, First Nations in the catchment area and environmentalists, which is bound to slow the process of construction start-up.

Bob Martin

Current Activities



Colin Smith - Speaker at the 2012 Annual General Meeting



Triumf Facility at UBC

March 21, 2012

Dr. Tim Meyer, Ph.D., Head of Strategic Planning at TRIUMF presented an interesting talk on the current activities at UBC. **TRIUMF** initially started as a co-ordinated effort by UBC, Simon Fraser and the University of Victoria, to do research into electronic particles by building a particle accelerator. The support group has now expanded to 17

universities across Canada. Its facilities are also used by researchers outside of Canada.

One of the key activities outside of basic research is the utilization of the **CYCLOTRON** to produce active isotopes for medical research and treatment, to augment the isotopes prepared at the Chalk River facility near Ottawa. The **TRIUMF** unit has the ability to vary the intensity of the beam to provide a wider variety of product. A new facility called **AERIAL** is now under construction and hopes to be in operation by 2015. **AERIAL** will have muon beam-line facilities, to produce more advanced rare heavy isotopes using the 10 uA main **CYCLOTRON**.

Dr. Meyer outlined briefly the wide range of elements that are part of an expanded periodic table of elements. He also explained how up to 10 forms of Hydrogen can be created by increasing the number of neutrons in its core, some of which are radio active with very short half-lives. He also noted that Carbon 14 which has a naturally occurring isotope of Carbon and its radio active decay is use in Carbon Dating. This short lived radio activity is why characteristics are so valuable in medical diagnosis and treatment.

Bob Martin

The Myths and Realities of Bio-Fuels

April 18, 2012

The presentation was given by **Chris Scott-Kerr, P.Eng.** Chris described how the production of Bio-fuels, primarily Ethanol, has increased greatly in the past few years, especially with the incentives provided to farmers in the USA to grow more corn. The production reached some 14 million US gallons in the USA and some 6 million gallons in Brazil. The Brazilian Ethanol is produced from sugar cane which is a more efficient process as the canes of bagasse, after crushing to remove the sugar, can be burned to fuel the distillation process. The USA system must use fuels such as natural gas or oil to refine the corn.

The other major Bio-fuel is Bio-Diesel which can be refined from animal offal and carcasses. Although the corn for Ethanol production is not as efficient as the Brazilian, the current argument is that there is a little more energy available from the corn that is used to produce it. In addition, recent figures seem to show that the food supply of corn is not greatly affected and the cost is in line with inflation. However, the efficiency will stay low until they can find a way to break down the cellulose in the woody part of the corn stalk to allow fermentation. There is research using various materials to provide a catalyst that would allow the cellulose and other woody starches to be broken down. One is the digestive juices of termites but this is very expensive.

Currently, most gasoline pumps have at least 5% ethanol in the mix and, as some of the pumps may be as high as 10%. In Brazil, vehicles operate on any mix up to 100% Ethanol. However, although Ethanol has a higher octane value, its calorific value is only about 67% of that of gasoline, so your car will not drive either as far or have as much power or both.

In BC, the current mix of fuels is 4,457 million liters of Gasoline, 234 million liters of Ethanol, 2,977 million liters of Diesel and 6 million liters of Bio-diesel.

Another area that has been using Bio-fuels for some time is the Pulp and Paper industry where the waste from the pulping process is used in the form of Black Liquor which is used to fuel the boilers along with fuel oil.

Bob Martin

An Engineers Travelogue

May 16th 2012

This presentation was by **Bob Martin, P.Eng.** Honorary Secretary for the Group, who gave an audio visual presentation of a trip he and his wife made in 2011. This was the 2nd part of the trip and continues from the previous portion.

The **Volendam** cruise called at **Nagasaki** and **Kobe** in **Japan**, **Busan** in **South Korea**, **Vladivostok** and **Petropavlovsk** in **Russia**, **Kodiak** and **Sitka** in **Alaska**, before sailing to **Vancouver**. The initial video showed the **Shim Bara Castle** just east of **Nagasaki**, which was the center for Christianity under a Spanish priest until the next Shogun had every Christian killed. Also shown were the types of homes that the Samurai and their families lived in, with wax models of the occupants in traditional clothing. One interesting aspect was a narrow stream of fresh water running down the middle of the street which was the supply of fresh water for the house occupants. The homes were of traditional construction with a mixture of tile and thatched roof and the room dividers were of rice paper on wooden frames. There was also a visit to a memorial for the victims of the landslide caused by a volcanic eruption and earthquake in the 1990's showing the half buried house.

The ship then sailed to **Kobe** where they toured the **Temples of Kyoto** which had floors which squeaked when walked on essentially to provide intruder alarm. There was also a visit to a **Heian Jingu Shinto Shrine** where a wedding was taking place as tourists were shown around the park grounds where a tree of pink blossoms turned out to be pink paper prayers,

From **Kobe** the ship sailed between the islands of **Kyushu** and **Honshu** travelling through the narrow pass and under the longest suspension bridge in the world, which joins the two islands.

The next port was **Bussan** in **South Korea** where they visited the **Beomeosa Temple** which involved climbing the stone stairs to the upper building. The pathway was covered in a wire trellis of hundreds of colored paper lanterns holding prayers. There were also memorial columns erected on the back of the stone turtles commemorating the senior monks.

Early the next morning the ship arrived at **Vladivostok** in Eastern Russia, docking at the terminus of the **Trans-Siberian Railway**. A walking tour of the town showed a community that

seemed to have neglected infrastructure with a lot of poor roads and sidewalks.

After some stormy days at sea the ship anchored out at **Petropavlovsk** on the **Kamchatka Peninsula** where it had been snowing a couple of days earlier and there were patches of snow on the ground. The town is now the home port for the **Russian Pacific Fleet**, but the Bay is so large you could not see the ships on the far side. The walking tour showed some of the buildings and there was a visit to a **Russian Orthodox Church**.

After five days and a stormy passage across the **Bering Sea** where the ship encountered waves of up to 9 meters, it anchored out off **Kodiak Island** in the **Aleutians**, where a walking tour showed some stuffed brown bears which stood some eight feet high on their hind legs.

After another long sea voyage crossing the International Date Line, the ship anchored at **Sitka, Alaska** on a bright sunny day. The tour covered a visit to the **Totem Pole Park** with some 20 totem poles of various styles and a visit to a raptor park where various **Bald Eagles, Hawks** and **Owls** were recovering from wounds.

The last part of the trip was the sail down the inside passage back to **Vancouver**, arriving early in the morning and sailing under the **Lions Gate Bridge**.



The Shimbara Castle



Susan Yurcovich, B.C.Hydro



Some Pictures taken on the Trip

The General Meeting 2011

Potential

September visit to Victoria. David Harvey noted that Spinnakers have an educational program covering the Brewing Process which might be of interest. There is also Craigdarroch Castle and Government House.

The Next Meeting will be on June 20

The Speaker will be Professor Bozena Kaminska and he will speak on Super Sensor Devices

Upcoming Events

Next Months Speaker