



The Challenge

THE NEWSLETTER OF THE WESTERN CANADA GROUP OF CHARTERED ENGINEERS

Message from the Chairman



As we approach the end of 2008, I can look back on my year as Chairman with much satisfaction. It started with a successful Annual General Meeting and dinner at the Royal Vancouver Yacht Club where we enjoyed an evening of dancing and networking

with good friends, excellent food and stunning views. Thank you for electing me as your Chairman; a job which I have much enjoyed and in which I trust I have met your expectations.

This year for the technical program we continued with the theme of sustainability, a theme initiated by our former Chairman, **Wilma Leung**. Wilma, who is passionate about sustainable development, has inspired us all to consider the greenhouse gas emission and energy efficiency aspects of our engineering projects. As a result our presentations focused on many different ways to address energy conservation and carry out "green" engineering.

In my previous report I mentioned that the presentations on fuel cells and building revitalization were well attended and most informative. These popular talks were followed by a fascinating description of the Integrated Waste Hydrogen Utilization project by **Hamid Tamehi** of Sacre Davy Engineering, and a field trip to the hydrogen fueling station in North Vancouver. Hamid outlined the pilot project in which waste hydrogen is captured as used as vehicle fuel for modified pick-up

trucks. He also gave attendees the opportunity to ride in and refuel his firm's vehicle at the world's-first high pressure hydrogen refueling station in North Vancouver.

In July we held the Annual Barbeque and phone box inspection at the Prices' residence, which was another enjoyable occasion. The well-attended barbeque was held on a warm summer evening with good food and excellent company. This year we were delighted to be joined by special guest, **Michael Thornley**, our former WCGCE Events Coordinator. Michael, now confined to a wheel-chair, was transported to the barbeque by Handy Dart. Later, the annual ritual inspection of the phone box was conducted by qualified engineers attending the event and it was duly declared fit for usage until some time in July, 2009!

Our September speaker was **Gary Killacky** who outlined the technique of Voltage Optimization for Energy Efficiency. In his talk, Garry demonstrated how he uses an energy audit to identify users that can benefit from local voltage adjustments to reduce power consumption and in-

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crease equipment life. Later that month we held our annual field trip to Vancouver Island, this year via Nanaimo, where we visited the Crow and Gate neighbourhood pub, to learn about the unique traditional timber framing used by its builder John Nash, during construction work in 1973. At the popular tourist site we enjoyed its renowned pub food and the hospitality of the owners, the Olsen family. The informative talk by **Matt Olsen** on the history of the pub was a big draw. The many members and guests then moved on to explore the BC Forest Museum in Duncan, where we enjoyed a wealth of industry exhibits and an exhilarating Discovery train ride through wooded terrain and along a lakeshore trestle.

In October, presenter **Sean Bolongaro** described Renewable Energy Opportunities in Western Canada. Of the many forms of renewable energy Sean described, the most promising for Western Canadians appear to be geo-exchange, run-of-river hydro, and energy recovery applications. There are many potential sites for run-of-river hydro, and British Columbia is a world leader in geo-exchange technology. Sean's fascinating talk prompted a lengthy discussion with the appreciative audience.

At the time of writing we are looking forward to our November speaker, **Keven Tagg** who will describe the \$1.9 billion Canada Line project, one of the country's largest Public Private Partnership undertakings. The Canada Line is part of BC's \$14 billion investment in transportation plan, a key component of the Province's greenhouse gas reduction strategy. The new line, which links downtown Vancouver with the Airport and Richmond City Centre, will provide the equivalent transportation capacity of ten traffic lanes.

The technical meetings and site visits during 2008 have exceeded expectations. The events, highlighted current initiatives aimed at improved energy efficiency and reduction in greenhouse gas emissions, were much appreciated by those attending. Thank you for supporting WCGCE activities in 2008 which we work hard to build on for next year. A vote of thanks goes to our Events Coordinator, **Arul Raja**, for his sterling efforts. If you have not supported our efforts recently, please join us in learning about many fascinating aspects of engineering in Western Canada. In the mean-

time, plan on joining us for our upcoming AGM and dinner event on January 10, 2009 at the Royal Vancouver Yacht Club.

Footnote on CPD:

Registered professional engineers in British Columbia are required by the Code of Ethics to undertake Continuing Professional Development (CPD) and to assist their colleagues in doing so. APEGBC has prepared CPD Guidelines and adopted them as policy. It is expected that before long mandatory reporting of CPD will be required for practicing engineers. All WCGCE technical meetings qualify as reportable CPD activity for Canadian registration bodies.

David Harvey

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.

Chris Richardson, C.Eng., MIET.

email: backwater@telus.net tel: (604) 879-9980

Technical Program Notes

Pacific Newspaper Printing Facilities

June 18th, 2008

The technical program was a tour of the printing facilities of Pacific Press, located at Kennedy Heights, Surrey, where the Vancouver Sun and The Province newspapers are printed. There were twenty people in the tour group. The tour was conducted by **Payam Farahbakhsh** a Mechanical engineer at the facilities.

To begin, we all met in the Board Room where Payam gave an excellent Power Point presentation regarding the processes involved in the production of the newspapers. After the presentation, the group was led through the various areas relating to the different stages of the printing process.

Electronic versions of the Sun and Province newspapers are first prepared (composed, ed-

ited and formatted) in the Newsroom facilities at Granville Square in Vancouver. When finalized, these are transmitted via a high-speed (10 megabytes per sec) dedicated fiber-optic cable to the printing facilities in Kennedy Heights in Surrey. The electronic data is used to generate negative films that are used to create plates for the printing presses.

The presses, manufactured by MAN Roland, in Germany, are the most technically advanced, and the



Man Roland Printing Press

fastest, in the world. Most of the operations are highly automated. There are four presses, two for The Sun and two for The Province. Each press can produce 80,000 copies of a 96-page newspaper in one hour! On average, the four presses consume about twenty tons

of newsprint paper each night.

The printing of each page of the newspaper is done using four plates wound on separate cylinders (drums). Each plate lays down a different basic colour – cyan, magenta, yellow and black. These four basic colours, in the right proportions, produce the required final colour. The position of the printing plates is monitored and controlled by computers to very fine tolerances. All the cylinder assemblies are



The Print Drums with Plates Attached

stacked vertically, from the basement to the ceiling. The blank paper is fed from the bottom of the stack.

After printing, sheets are cut, folded and stacked, all automatically, and the newspapers are sent to an area where advertising flyers, supplements and other material are automatically inserted.

In the Mailroom, the newspapers are bundled and stamped with special bar-codes indicating their final destinations. In the Distribution Center, a bar-code reader automatically directs the bundled papers to transport vehicles for delivery throughout Province.

The tour lasted about two hours. Arul Raja thanked Payam for the tour.

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Report by Bob Martin

Structural Inspection of the Crow and Gate Pub

September 27th, 2008

On September 27, 2008, the annual visit of the WCGCE members to Vancouver Island included a structural inspection of the **Crow and Gate Pub** combined with a visit to the nearby **Forest Discovery Centre**.

Jack Nash, an ex-patriot from Sussex, England, built the Crow & Gate Public House on ten acres of scenic property in Cedar, near Nanaimo, on Vancouver Island. In 1975, it became the first neighbourhood pub in British Columbia, a well-known landmark and favourite destination for locals and tourists alike. Construction of The Crow & Gate Pub entailed great attention to detail. Pegged beam & plaster, exposed beams, massive stonework open fireplaces, heavy wood trestle tables and, throughout, clad with authentic pub memorabilia from the U.K. all create a very English ambiance in rural British Columbia.

Matt Olsen provided the WCGCE group with a full technical description of the original construction and subsequent modifications. He pointed out that the original construction was all done using 100% recycled lumber and traditional carpentry with dowelled connections. No reference was made to any plans and none exist. Not one nail was used for the original building, although the building extension which occurred during the 1990s uses current building methods and is code-compliant. Matt's family have owned and operated the Crow and Gate for the past 20 years.

WCGCE Chair David Harvey formally thanked Matt for his efforts on behalf of the visiting group.

Some 30 members and guests visited the Crow &



The Inspection Team

Gate, and were treated to a tasty lunch at the pub which is well known for its catering excellence. It was encouraging to see strong representation from the

WCGCE Vancouver Island membership which included six individuals from Victoria and two from Nanaimo. After photos were taken of the group,

enjoying the glorious weather, in front of the scenic Crow & Gate Pub, the majority then travelled south on Highway 1 to Duncan for the second part of the field trip.

The **BC Forest Discovery Centre** is a museum dedicated to preserving the history of the forest industry in British Columbia. Committed to public education, the 100-acre living museum features interpretive trails, an antique vehicle display, and a wealth of exhibits indoors and out.



Chairman & Cecilia Bernabe (left), with George and Carine De Ridder in the Welcome Museum

In the Welcome Museum there are state of the art interactive exhibits, along with displays of yarders, speeders, and other forestry vehicles. There is also an 1880s logging camp complete with two blacksmith shops and school, as well as a heritage sawmill, a lookout tower and ranger station.

The star attraction is definitely the figure-of-eight Discovery train ride through the scenic grounds, for which steam and railroad buffs travel from far and wide. The track traverses an ancient Douglas Fir forest, passes by the train sheds and sawmill, crosses the timber trestle over Somenos Lake, and features an 1880s-style water tower for replenishing steam locomotives. The 15-minute ride includes a halt to allow exploration of the exhibits, and then either a train ride or a stroll through the forest back to the station near the main entrance.

Overall the visit was well attended and much appreciated by the participants. We hope to follow up with another WCGCE visit to Vancouver Island in 2009.

Report by David Harvey

Optimizing Voltage for Energy Savings

September 17th, 2008

The speaker, **Gary Killacky, I.Eng** presented a Power Point outline of Optimizing Voltage for Energy Savings. Garry gave an interesting talk to a small (15 members and guests) but very interested group.

He pointed out that most voltage levels of systems

in B.C are higher than that required by the equipment, so better control over the voltage to keep it closer to the optimum voltage can result in energy savings.



Electrical Harmonizer-AVR

He outlined the relationship between, kW, kVA and kVAR, and the cost to the customer in higher than needed kWh and demand costs. He gave a number of examples of buildings which had installed the control device his company sells and the resulting energy savings. The device is essentially an auto transformer which can be tuned to suit the building requirements and is controlled by a built in computer system.

Gary answered a number of questions and there was a lively discussion with the audience.

Our chairman, David Harvey thanked Gary for a very interesting and thought provoking talk and presented him with a coveted WCGCE umbrella.

Report by Bob Martin

Renewable Energy Opportunities in Western Canada

October 7th, 2008

The speaker was **Mr. Sean Bolongaro, P.Eng, C.Eng, MIMechE**, who gave a presentation on Renewable Energy Opportunities in Western Canada.

His Power Point presentation outlined a variety of renewable energy including; Wind Power, Solar Power, Hydro, Geo Exchange, Biomass, Wave and Tidal energy and Energy Recovery.



German Wind-farm

With Wind Power, he noted that its output is variable relative to the wind speed and availability. Too much wind is as bad as too little and excessive wind can damage the units. The overall output efficiency is between 20 and 30% of the rated power of the units. A critical aspect is the ease of connecting the units to the power grid. Location of the units have to be carefully selected both for wind availability, but also to not annoy people, and to minimize injury to birds and bats. The latest units are mounted on the top of large diameter tubular towers and maintenance access is via a ladder in-

side the tower. Unit sizes can vary greatly but the larger units are between 1 and 4 Mw capacity. Large numbers are installed in Europe mostly off shore.

Solar Power is very expensive and is usually photovoltaic or concentrating heliostats, water heating can be provided by simpler devices and self contained units are common on the roof tops in Europe. With B.C. weather patterns summer has the most likelihood of success for installations such as swimming pool heating. A good combination for remote areas is a combination of wind and solar to reduce say the fuel demands of a diesel generation plant.

Geo Exchange is a new name of ground source heat pumps, which use the ground a source and a sink to dispose of excessive hear from air conditioning. A lake or pond also provides a good source. A recent development is the use of a heat exchange system which separates the fluid carrying the heat from the earth to a loop containing a lower boiling point liquid such as iso-butane which is vaporized and drives a gas turbine to generate power. Carrier Air Conditioning have converted some of their turbo refrigeration compressors to operate as power units.

Biomass is any organic material, such as straw, wood, garbage, to be combusted to generate steam or converted to biodiesel, which is more versatile and transportable.



Small Run-of-River Hydro-electric Turbine

Wave Energy and Tidal energy was lightly covered as this area is still in the research development stage, but B.C. has great potential around our coast line. Most of the advance trial work is being done in Europe and

the Scottish developed Pelamis wave generation unit is under trials off the coast of Portugal. Under-water tidal units like wind turbines are also being worked on.

B.C. is very blessed in having most of its electrical generation by large unit hydro plants, but current interest is in smaller run of river and low head installations. Pumped storage was also noted but is mainly used for demand control.

Energy Recovery is where water at higher pressure has to be reduced before use, usually using a pressure reducing station. This can be modified to use a small turbine which generates some power as it reduces pressure.

Sean noted the variety of support structures and engineering required for each type of installation which allows local engineering companies to become involved even when items such as wind power generators are imported.

Although we had a very small turnout (16 members and guests) there were many questions and a lively discussion

Our chairman, David Harvey thanked Sean for a very interesting and thought provoking talk and presented him with a coveted WCGCE umbrella.

Report by Bob Martin

Current Activities

Inspection of the Phonebox

The Summer BBQ/Technical Program was attended by about 30 members and guests. Dinner was provided with a selection of vegetables to go with the barbeque meat provided by the guests, plus a cake to celebrate our 16th year having our summer get together at the Price's.

Ian and Jane were thanked for their hospitality.



The guests conducted the annual review of the salvaged red British Telephone box which was found to in full working order. The structural integrity of the Gazebo was also reviewed and found to be standing up to the vagaries of the weather and winds of the past winter. The infra red heating system for the Gazebo was not required as we had pleasant mild evening.

There was one special guest at the meeting. Michael Thornley who was our Meeting Committee chair was struck down by a stroke about two and half years ago. He and his wife Joan managed with the aid of Handy Dart to get to our meeting. As Michael is in a wheel chair, being paralyzed on one side, and the Price's having a very steep driveway up to the house, this was no small feat.

Everyone was very glad to see Michael and hope he may manage to get to some of our other meetings.

Report by Bob Martin

Other Business

IMechE Regional Officer's Seminar - London

June 12th, 2008

At the invitation of the IMechE, I attended the IMechE Regional Officers Seminar at the IMechE headquarters at Birdcage Walk, London on June 12, 2008, on behalf of WCGCE,

There were some 73 attendees mainly from the UK. The other overseas guests were reps from Hong Kong, Malaysia, Central Canada and the US rep for ASME.

We assembled in the Main Hall at 10:30 where **Colin Brown**, Director of Engineering chaired the meeting and made some introductory remarks. He updated the attendees on the IMechE Strategy and Business plan. **James Hobbs**, Director of Marketing followed with an update on the IMechE Marketing & Communications Plans.

At about 11:30 we broke up for some light refreshments and then divided into five groups for discussion forums on the following:

- Recruiting and Retaining Active Members
- How to Plan and Run Events
- Supporting your Members in their Professional Development
- Budgets and Finance
- Industrial Liaison Officers

I attended the Recruiting and Retaining active members which was facilitated by **Penny Bosman** of Regional & International Operations. She was assisted by **Lara Mallet**, Regional Manager.

After introducing ourselves we discussed some of the motivations and needs that activate members to participate at meetings. These varied from young members looking to getting registered as Chartered Members to more mature members looking to give their time to assist other members and the Institution. The younger members felt the need to demonstrate that they participate in the local branch meetings

Networking was a key motivation for many.

All these attending were looking for ways to get more participation by their members at the branch meetings. We will be receiving a summary of the discussion from the meeting.

After lunch we again assembled in Main Hall where we had summaries on the following:

- Continuing Professional Development Update by **Annie Davison CPD**
- Regional Managers Update by **Steve Gasser**, Regional Manager
- The Ambassadors Program by **Habiba Choudhuri**, Schools and Student Marketing Exec.
- Media & PR Update by **Richard Campbell**, Senior Communications Manager

At 15.35 the meeting concluded and there was further refreshments and time for more networking with the other attendees.

I found the meeting interesting and got a different viewpoint in that all the members were members of one institution. Most of their problems are typical of any group of members of a society or group of people with common interests. Many competing demands and interests such as family, TV, Internet, and other groups they may also be involved with.

I had a meeting with **Neil Bailey**, ICE International Members Coordinator. **Tom Foulkes** was out of town. We now have agreement that we will be getting the update of the ICE members and I signed a release similar to the one I signed for IMechE. Neil also informed me that WCGCE member Wilma Leung had been accepted as the new ICE rep, and he outlined the meeting they are planning for Los Vegas.

I also had lunch with **Keith Eaton** CEO of IS-tractE, and we discussed matters of common interest.

Report by Bob Martin

ICE Americas Convention—Las Vegas

3rd—5th October 2008

ICE members and their guests from across the Americas, along with ICE president, **David Orr**, and Director General, **Tom Foulkes**, attended the first Americas Convention, October 3rd-5th, in Las Vegas, hosted by ICE Country Representative (US Western) **Simon Gray**.



Brian Isherwood (left) and **Wilma Leung**, ICE Reps for Central and Western Canada with ICE President **David Orr**

Feedback was very positive, with all present commending the quality of the pres-

entations and speakers. As a result, the Americas Convention will become a biennial event, with the next Convention planned, provisionally, for June 2010.



Wilma Leung with **David Caiden**, who represents the Americas on the ICE member's Council

Friday was a Business Day for ICE Country Representatives (representing North America, South America and the Caribbean). They discussed issues relevant to members in their respective regions and shared strategy and plans for future ICE activities locally.

Saturday was the main conference day consisting of over a dozen expert presentations on Sustainability, held at the Desert Research Institute. **Peter Head** kick-started by presenting the 7th International Brunel Lecture: *Entering the ecological age: the engineer's role*. This was followed by **Peter Goodwin's** mind-stretching *"Human, Physical, and Natural Capital Investment in Patagonia: a Predictive Approach under the Sustainability Criterion"*, and then by **Gary Lawrence's** thought-provoking delivery on *"The Problem of Conventional Wisdom"*. **Tim Quinn's** career-long excitement was condensed in *"California Water – Managing Crisis and Opportunity"* which was presented in the afternoon alongside other expert technical presentations.

Technical tours to the Hoover Dam and O'Callaghan/Tillman memorial bridge took place on Sunday.



The O'Callaghan/Tillman memorial bridge under construction



David Orr, ICE President (left) with fellow members at the Hoover Dam

WCGCE has recently offered to host the 2010 Americas Convention in Vancouver and has tentatively proposed "Innovation" as the theme. The proposed venue and theme will be further discussed before being confirmed in 2009. In the meantime, please send your ideas to **Wilma Leung** at wilma@wisa.ca to help put our thoughts and plan together for a formal proposal.

Report by Wilma Leung

Upcoming Events

AGM AND DINNER EVENT

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

Date: Saturday 10th January 2009

Time: 5:45pm

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

Guest and spouses of members attending the AGM may join an informal reception prior to the dance.

Contact **Alan Kay** for tickets at 604-922-6150 or alan.akay@shaw.ca

-SEE ENCLOSED FLYER-

Other Business

Jim Gordon

The editor and WCGCE Committee are sorry to hear our IMechE rep. **Jim Gordon** is so ill. We wish him a speedy and complete recovery.

The Commander S M Terry Award

Congratulations are due to **Daniel Sitter**, a graduate of **BCIT Mechanical Design Program**, seen below (right), being presented the **Commander S M Terry Award for 2008** by the Program Head, **Ken Wong**.



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

WCGCE Award

Congratulations are due to the following third year **UBC** students who are recipients of the WCGCE awards for 2008:

Mr. Peter Cornelius Pawliuk of Vancouver BC,
(Electrical)

Mr. Duncan Fredrick Clinton Currie of Surrey BC,
(Mechanical)

Mr. Donald Leslie Burkholder of Burnaby BC,
(Civil)