

# WESTERN CANADA JOINT GROUP OF CHARTERED ENGINEERS NEWSLETTER

SUMMER 1993

## CALGARY CHAPTER

INSTITUTIONS OF CHEMICAL, CIVIL, ELECTRICAL, MECHANICAL AND STRUCTURAL ENGINEERS

### Chairman's Comments

By Eur Ing **David Hood** CEng, MIEE, MIMechE

During the last few months the Calgary Chapter has been reviewing the structure of the engineering institutions here in Alberta with a view to optimising the service we provide to our members. It was concluded that being the "Calgary Sub-Group" of the Western Canada Chartered Engineers' was not the best way to deliver that service. It has led to unnecessary mailing costs from Vancouver since they had responsibility to keep all the members informed of their activities whilst being aware that no-one was going to travel from, say, Grande Prairie to Vancouver to attend an AGM or technical meeting. Further, with regard to *local* representation, Vancouver can seem only a little closer to Grande Prairie than can the U.K. Also, members in Alberta have been receiving mailings from both Vancouver and Calgary, which has led to some confusion

I raised these issues informally with Vancouver and with the Institute of Mechanical Engineers in London—the corresponding Institute for our group—during a recent trip there. I found both Vancouver and London to be sensitive to our concerns and we informally discussed moving the Alberta group to an autonomous status separate from Vancouver. This has yet to be formalised, but based on the recent discussions I do not believe that this is likely to be a problem. If we were to achieve a consensus then the new group would probably include Saskatchewan, Alberta, and the North West Territories. We would create new positions on the Committee with the responsibility of corresponding with representatives of other centres, and solicit representation from new local chapters.

Please refer to the 'Events Calendar' for upcoming events in the Calgary area

For Alberta for the five Institutions the numbers of members by location are as follows:

Brooks	0.5%	2
Calgary	54.7%	228
(Airdrie	0.5%	1} <i>Calgary</i>
(Okotoks	1.0%	4} <i>Calgary</i>
		233
Cochrane	0.2%	1
Edmonton	22.8%	95
(Sherwood Park	4.1%	17} <i>Edmonton</i>
(Spruce Grove	0.7%	3} <i>Edmonton</i>
(St. Albert	4.8%	20} <i>Edmonton</i>
		135
Forestburg	0.2%	1
Fort McMurray	5.8%	24
Fort Saskatchewan	1.0%	4
Jasper	0.2%	1
Lethbridge	1.0%	4
Lloydminster	0.2%	1
Medicine Hat	0.7%	3
Medley	0.2%	1
Olds	0.2%	1
Ralston	0.2%	1
Red Deer	1.0%	4
Whitecourt	0.2%	1
Total		417

### Welcome to the Structurals and Chemicals

I am pleased to be able to announce that *formal* approval has now been given from London for the Institute of Structural Engineers and the Institute of Chemical Engineers to join the Civils, Electricals and Mechanicals in our Group. This is the result of an initiative that began in Calgary some time ago.

Welcome to our group to those of you receiving our Newsletter for the first time.

## Construction Dispute Resolution Through Mediation

### *"A More Palatable Solution"*

Co-Authored by **Micheal Wheeler**, FIMechE

Mediation, as defined by the Alberta Arbitration and Mediation Society, is a process of dispute resolution in which a neutral third party assists the parties involved in a dispute to negotiate their own settlement. This is quite different from Arbitration where the parties refer their dispute to a mutually acceptable independent Arbitrator or Arbitration panel. This process is adversarial in that each party, through an advocate, presents its position. At the conclusion of the hearing the panel renders its judgement which is legally enforceable.

Like arbitration, the third party in mediation is chosen because of a familiarity with the nature of the dispute. However, the Mediator is not charged with the ruling on the dispute but rather with facilitating a mutually acceptable settlement between the parties. Contrary to arbitration, the Mediator does not choose a winner and a loser. The spirit of mediation is one of agreement, not of conflict. Cost savings occur not only as a consequence of the reduction in time, but also due to the absence of advocates.

The parties selecting mediation incur two forms of cost, an administrative fee and the Mediators fee. Administration fees normally cover the services of providing the location for the hearing. Mediator's fees are a function of the individual's experience and background.

In large corporations, governments and agencies, the question often arises concerning the choice of in-house versus outside Mediators. There are many advantages in choosing someone who has absolutely no connection with the dispute. The parties in dispute will more readily accept the claim of confidentiality and impartiality. The Mediator has no financial or other interest which might be perceived as a bias or influence to the way the mediation is conducted.

A common concern in any dispute is the potential impact on future business relationships. The two fundamental factors that encourage negotiation of any dispute are the high costs of traditional means of resolution, and the desire to maintain business relationships. Any process that involves a judgement or decision from an outside party will impact relationships, as there is invariably a winner and a loser.

The mediation process, on the other hand, is designed to find a win-win solution through non-adversarial procedures.

The mediation process is perhaps best expressed by Fisher and Ury in their book, *"Getting to Yes"* in which the authors identify four steps in their process of principled negotiation.

These are:

1. separate the PEOPLE from the FACTS,
2. focus on INTERESTS not POSITIONS,
3. generate a variety of POSSIBILITIES before deciding what to do,
4. insist that the result be based on some OBJECTIVE STANDARD.

Initially, the Mediator must clearly explain the process and seek commitment of the parties to it. Each party should declare that they are prepared to accept the guidelines described by the Mediator and that they have the authority to move from their initial position statement if such movement is fair and (or) makes sound business sense.

The next step is to focus and agree on the issues. Where is there common ground? What is at issue? Which facts can be agreed on and which can not? Through this process the Mediator develops an understanding of the parties and their concerns, which allows the Mediator to help focus the parties on reaching a mutually agreeable solution. The strategy is to assist the parties in developing, considering and agreeing on options which will ultimately become their solutions.

The final step in mediation is the parties' agreement. It must be understood that whereas mediation is voluntary, once an agreement has been reached it should be implemented. To this end the Mediator will prepare a Memorandum of Understanding outlining the issues and agreements reached, which must then be confirmed and accepted by the parties. Implementation of the agreement in legal form is the responsibility of the parties' solicitors.

The obvious benefits of Mediation are best expressed by the Alberta Arbitration and Mediation Society as follows;

- leaves control of the outcome in the hands of the disputing parties,
- is flexible, allowing disputants to explore a wide range of options open to them;
- is fast, enabling disputants to save time and money;

- is confidential, avoiding public disclosure of the conflict, and of confidential business and personal information;
- can preserve business and personal relationships by improving communication and understanding through non-confrontational problem solving.

*Refer to 'Events Calendar' for information about the upcoming Seminar to be given by Stephen Revay.*



Planning for Reductions at the University

By **Nigel Shrive** FICE.  
Professor of Civil Engineering, The U. of C.

You probably heard the news, or saw in the paper that the University is planning to reduce its size. The target assigned to the Faculty of Engineering was to reduce the overall operating budget by 17% based on the 1992/93 budget and staffing levels. There were two stings in the tail of the planning exercise.

The first was that salary reductions due to staff retirements this year under a previous early retirement scheme were not to be counted as budget reduction. For the Faculty, this was not particularly meaningful because of the second "rule": reductions in academic salary could only be counted if the position was closed: that is, if no replacement were hired. If an academic staff member retired and it was proposed to hire a replacement, the difference in salary could not be counted as a budget reduction. The scene was complicated further by the fact that support staff levels have been reduced over the previous few years by successive reductions in budget. The Faculty is now in the state that further reductions are considered potentially to have a much more serious detrimental effect on the programme than reductions in academic staff.

Since many of the academic staff are in the latter stages of a normal career, initial planning assessed the impact of not replacing staff who retire. The required salary reductions could not be made and serious imbalances in the various departmental staffing levels would accrue. With another early retirement incentive scheme, and assuming additional staff would take up that scheme, the requisite salary reductions could be achieved. Some replacement of staff to maintain departmental balance could also be allowed. The net effect was a 20% reduction in the academic staff, a more than 20%

reduction in actual budget, but only a 17% reduction given the rules above.

The effect of losing just about all the senior academic staff is devastating, as you can imagine. Reduction in research grant funds to the Faculty would be about 25%, with a concomitant reduction in graduate student numbers. Further, there would simply not be enough staff left to teach the undergraduate programme! With 20% gone, theoretically, the remaining 80% have to increase their load only (!) by 25% to maintain the same overall teaching effort (this in addition to the 35% documented increase which has occurred over the last 15 years). However, it is not that easy unless you allow electrical engineers teaching structural mechanics!. People have to "fit" technically.

What then are the choices? Cut the number of courses and risk accreditation? Force remaining staff to increase their teaching loads, and thereby reduce their ability to perform research, obtain grants and train graduate students? This contravenes the University's stated intent to increase graduate student numbers and research activity because of the beneficial flow-through of funds to the Calgary economy. It will be interesting to see how the University's Planning Committee reacts to the analysis presented.



The Dismantling of a C.P.R. Bridge

Mile 105.3—Alberta District—Empress Sub-Division

On Friday March 19th **Mr. John Spronken** P.Eng., P.E. principal of J. R. Spronken & Associates Ltd.—introduced by **Ron Girardau**, CEng.—gave this interesting illustrated presentation. The piece of equipment designed by Spronken was not only an inspiring example of the application of engineering principles but also of practicality and boldness. A number of the spans—each removed as a single piece—have been re-used by C.P. Rail.

The following is a summary.

"This bridge spanning the South Saskatchewan River located five miles east of Empress was completed on 1914 and served until abandonment of the rail line in the late 1980's. Consisting of 37 spans bearing on piers at 75' 2" centres the bridge was approximately 2,775' long. The southerly eight spans formed a curve varying

from a spiral configuration to a full 4° curve with 7.5% super elevation for the last four spans.

Warm weather during the winter of 1991-92 prevented the construction of an ice bridge and so removal had to be accomplished from the top using specially designed equipment which would permit steering around the curved portion of the bridge.

Our client Wearmouth Demolition Services Ltd. of Calgary commissioned us to design such a piece of equipment. Bonnybrook Steel Ltd. was contracted to fabricate the unit. Since the contractor's plans and budget estimates were no longer valid the entire project was in what now could only be termed uncharted waters. Removal of straight bridges had been successfully accomplished, but removal of a curved bridge from above was a new experience. To complicate matters further, time was now of the essence. It was also requested that we utilise used members and equipment as far as possible to minimize costs.

Fortunately Wearmouth was also involved in the demolition of the Cominco Plant in Calgary and it was possible to re-use many of the WF36x230 columns. These members, up to 100' in length were used as main carrying members to support the gantry runway cranes (GWB) and also used in a horizontal position as a compression chord in the counterweighted relocation truss (CWRT). Our only concern with these members was their weldability, however this was competently handled by Bonnybrook Steel. Rolling stock, with the exception of the "locomotive", were salvaged C.N.R. tank car bogies.

The CWRT was used to move the gantry beam into place which then positioned itself onto piers by the use of hydraulic cylinders. The CWRT then retreated to the end of the bridge and the small "locomotive" brought two specially equipped bogies which were then positioned at the end of the bridge.

The span was lifted using a special clamp which affixed itself to the top flange of the girders. These clamps were raised by two 'A' frame gantry cranes and, when sufficient height had been attained, the span was moved onto the forward bogie and the whole pushed forward by the aft 'A' frame until the rear of the span could be safely lowered onto the aft bogie. The entire dismantled span was then pulled along the track to be removed and subsequently hauled away.

Following the removal of the span the G.W.B. was "steered" aft using a hydraulically activated beam until it was aligned with the chord of the next span to be removed. The CWRT was then hooked to the GWB, the support legs retracted and the whole moved forward to the next span. When properly located the hydraulic legs were extended to the top of the piers. The CWRT unhooked and removed and the entire operation repeated.

All bearing plates, rollers, and other remaining hardware were removed and set aside for re-use by the C.P.R. Removal of these units which had to be done mainly by hand was the controlling factor in the whole operation. Removal of the spans took only one third of the total time.

While we consider the removal of the bridges as a successful operation, we must admit to a certain nostalgia at seeing part of our relatively short Western Canadian history disappearing."



#### Shell Canada's Caroline Field on Stream

By **Mike Milligan**, CEng. MIMechE

In March, Shell Canada's \$1 billion Caroline gas plant came on stream processing sour gas from the 2 TCF of reserves discovered in 1986. When discovered Caroline represented the biggest gas find in the western Canadian sedimentary basin in 20 years.

The plant, about 160 km northwest of Calgary, will produce enough energy to heat a city of 250,000 for 25 years. The Caroline gas plant is Alberta's largest sour gas operation. Shell operates the gas plant and the Caroline field itself, and has a 72% interest.

Safety and environmental protection have been key concerns throughout development of the Caroline complex. The field underlies a populated rural area in the province in prime ranching and residential country between the towns of Sundre and Caroline. A consultation programme with residents and local communities was begun soon after the field's discovery. The statistics tell the story of Shell's unprecedented effort in the community; at least 30 meetings with the locally appointed Caroline Advisory Board; 25 major public meetings and more than 1500 meetings with individuals in the area. The consultation exercise made

it abundantly clear that there were concerns over the possible environmental effects of a new plant, but it also became plain that local communities appreciated the value to their economies that the Caroline development would bring in terms of new jobs and increased trade. During development of the field, well testing and flaring of the sour gas was kept to an absolute minimum. In some cases wells were not tested to flare but, instead, will be stimulated and flowed clean through their flowlines to the plant. Working cooperatively with local communities throughout the development drilling phase and construction has been key to the success of Caroline. Safety has remained a first priority throughout the Caroline development. Shell received an award from the Alberta government for its safety record during plant construction, which was four times better than the provincial average for the construction industry. As many as 2500 workers were on site at the peak of construction activity.

The Caroline plant is designed to process 300 MMSCF/D of raw gas with an H<sub>2</sub>S content of 35%. It will produce 18,800 BDP of condensate, 4,000 tonnes/day of sulphur, 100 MMSCF/D of sales gas and 26,400 BDP of NGL's. Sulphur recovery units and the Shell Claus off-gas treatment (SCOT) units will recover at least 99.8%—the highest sulphur recovery of any major gas plant in North America. Water and chemical recycling were optimized in design of the plant and energy consumption has been minimized.

The produced sulphur will be transported 41 km south along the world's longest underground liquid sulphur pipeline to the Shantz sulphur forming facility. The sulphur pipeline is surrounded by a heavily insulated pipe carrying hot water. Gas flared heaters at either end of the line circulate the water in continuous loops to keep the sulphur above its melting point. Once at Shantz the sulphur is pelletized for storage for export. The solid sulphur is exported in 10,000 tonne loads by trains running round a loop line surrounding the plant.

The Caroline complex is spread over 400 sq. km. and includes a 217 km gas pipeline gathering system with three gas compressor stations to service the 15 producing wells capable of flow rates in excess of 30 MMSCF/D. Each well tubing is equipped with a

surface controlled subsurface valve to maximize safety of the installations.

The drain on the resources of Shell Canada was high—during construction of the Caroline plant an estimated \$1.5 million was spent each day. The rewards are likewise potentially great—once fully on stream Caroline is projected to generate about \$700,000 per day.

Although Caroline represents a tremendous opportunity for Shell Canada, its fellow stakeholders and Alberta generally—through taxes and employment—the expertise which has gone into the plant and the wells will not only be of benefit for the development of Caroline. Caroline's gas, like much of Alberta's, is sour and contains high levels of H<sub>2</sub>S. Caroline's 35% H<sub>2</sub>S content is dwarfed by another nearby Shell field, Bearberry, discovered in 1969 but so far not producing commercially. Super sour Bearberry at 90% H<sub>2</sub>S represents 30% of Alberta's sulphur reserves. A recent demonstration project conducted by Shell Canada showed the technical viability of producing such ultra-high H<sub>2</sub>S. Two wells produced continuously to a stand alone gas processing facility built especially to handle Bearberry's reservoir fluids. To prevent sulphur deposition downhole in the wells a sulphur solvent was circulated continuously. The project was a technical success and the wells produced for eighteen months with only minor difficulties. Unfortunately current sulphur prices can not justify commercial development. But in the future as sulphur demand and prices increase and with the proximity to the Caroline gas plant, it is only a matter of time before Bearberry ultra-sour comes on stream.



#### Telephone Survey of Members

By **Paul Camwell**, C.Eng. MIEE

In February 1993 your committee conducted a survey of general members. The intent was to establish a representative indication of the services and events members would have the committee provide. The telephone survey of a sample of over 200 asked the following questions:

Have you been receiving the Newsletter?  
 Do you wish to receive the Newsletter?  
 Are you interested in local events?  
 Do you wish to be reminded by phone of imminent local events? What would you have this organisation do for you?

Results were as follows:

Of the people for whom we had a current telephone number, 12% were retired or were not available for comment because they were working out of the province. 40% of the telephone numbers were not current.

Of those we spoke to;  
 86% were receiving the Newsletter,  
 75% wished to continue receiving the Newsletter;  
 56% were interested in local events (11% undecided);  
 28% wanted to be reminded of imminent events.

The most frequent responses to the last survey question were:

Provide more frequent technical meetings (most requested).  
 Provide general opportunities to meet other CEngs.  
 Organise technical visits.  
 Organise social events.  
 Lobby for APEGGA acceptance of CEng. qualification.  
 Provide assistance to members looking for employment.

Our Responses:

—For technical and social visits see the 'Events News' below.

—Regarding registration with APEGGA; the situation continues to improve following the signing of the Washington Accord—as covered in our last Newsletter. For those interested, who either did not receive that newsletter, or have specific questions, please write to **Nigel Shrive** at the Bankers Hall address. Also note that **Tony Howard** is a member of our Committee.

—Regarding employment assistance; the present list of Alberta members can be sorted by location and discipline. This would provide a networking resource for Engineers searching for a job—although we would suppress home telephone numbers. If you require this service write to our Bankers Hall address and specify your needs, we will sort and send the appropriate listings. *If your company is hiring then let us know your requirements, we could pass along details of available members who could possible fill your need.*

Closing comments—if you want your opinions to be known and were not contacted in the survey, please get in touch with me at 256-4198—or write to the P.O. box address below, or facs. to 295-4638. Also please take the time to update us on any changes to your address or telephone number.

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Committee for 1993

<b>David Hood</b>	Chairman
<b>Bob Owens</b>	Vice Chairman
<b>Pai Lin Li</b>	Past Chairman
<b>Chandra Gajjar</b>	Secretary
<b>Martin Gough</b>	Treasurer & Newsletter Editor
<b>Nigel Shrive</b>	APEGGA Liaison
<b>Paul Camwell</b>	Communications & Membership Lists
<b>David Elson</b>	Technical Program
<b>Mike Milligan</b>	Social Program
<b>Ted Maciag</b>	General
<b>Mike Wheeler</b>	General
<b>Alistair Limpitlaw</b>	General
<b>Tony Howard</b>	General

Correspondence to:

**The Secretary**  
**P.O. Box 22136**  
**Bankers Hall**  
**Calgary**  
**Alberta T2P 4J5**

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## EVENTS NEWS

### SPECIAL EVENT

We are very fortunate that, with thanks to Micheal Wheeler, Stephen Revay will be presenting "Avoiding Construction Disputes"—see below—All practicing engineers, other than perhaps those involved only in teaching or research, will find this seminar relevant. We trust that this event will be well attended, for if so it may become the first of a series.

The following is an abstract of the presentation:

"These days an almost mandatory byproduct of a construction project are claims. Recent statistics are somewhat alarming. A 1991 study by the Construction Industry Development Council on "Alternate Dispute Resolution Mechanism and Contract Settlement" states, in part:

*"In the U.S., where business concerns over the cost of litigation is more advanced, the American Society of Civil Engineers claim that litigation costs, on a national average during the 1980's ran the actual cost of building up by an estimated 20%. If applied to the Canadian construction contracting industry in 1990 (estimated at \$54 billion in revenues), 20% would represent \$10.8 billion worth of inflation accounted for due to litigation"*

To circumvent this counter productive trend there is a need for a more informed approach to contracting and claims. Unfortunately, the current focus is not on the measures which can be employed to minimise claims, but rather on the process to expedite resolution of

disputes. Hence the proliferation of articles and seminars which exist on alternate dispute resolution—ADR. However, ADR only deals with mitigating the effects of the problem and not the cause for the problem. So to achieve a better understanding of the problem, Mr. Revay will, in his presentation, focus on the following issues:

- Definition of a Claim;
- Essential Element of Claims: Cause - Effect and Entitlement.
- Reasons for Claims: Quantity - Quality - Methods and/or Sequence.
- Means of Avoiding Claims: By Contract - By Project Management.
- Means of Defending Claims: Notice Provisions - Record Keeping.
- Claims by Owners: Tenders - Non-Performance - Deficiencies - Delays - Liquidated Damages vs. General Damages.
- Claims by Contractors: Impeded Access, Late Drawings and/or Equipment, Changed Soil/Site conditions, Active Interference, Construction Acceleration, Delays, and Impact Claims.

### Background Information

Mr. Revay has been involved in the analysis of progress, productivity and cost on numerous construction projects throughout Canada, in the United States, and in the Middle East. The Claims have ranged in size from \$25,000 to \$80 million. Mr. Revay has authored articles for various construction periodicals and conducted numerous seminars on claims to owners and contractors alike."

## EVENTS CALENDAR

*Instructions for use of this page:  
Tear it off and pin it to your notice board or  
stuff it into your daytimer—or photocopy it  
and do both!*

\*\*\*\*Support Your Profession\*\*\*\*

### PUB NIGHT

**Friday, June 18th, 7.00pm.** at the "Fox and Hound" Public House and Restaurant, 7304 MacLeod Trail S. Calgary.

A social evening of darts and conversation in the comfort of an "English" pub, with good pub food.

(Notice not required.)

### DESIGN AND CONSTRUCTION OF ETHYLENE OXIDE PLANT, JILIN CITY, NORTH EAST CHINA

**Friday, September 17th, at 7.00 pm.** at the Danish Canadian Club 727 11th Avenue S.W.

Speaker: **Ian Laird** P.Eng., Director of Mechanical Engineering at Fluor Daniel Inc., Calgary. Mr. Laird will describe the experience of constructing a \$60 million plant in a remote part of N.E. China.

*The experiences described will not necessarily all be of a learned technical nature!*

The talk will include a description of the events and meetings—many of which were unusual, humorous and surprising—which took place during the design period, together with illustrations of points of historic interest, such as the Great Wall of China, and the Forbidden City.

Cultural differences, and their effect on the business approach will also be discussed.

(Notice not required.)

### AVOIDING CONSTRUCTION DISPUTES

**Thursday, October 14th, at 6.30 pm.** at the Danish Canadian Club 727 11th Avenue S.W.

Speaker: **Stephen Revay**, Western Regional Manager of Revay and Associates, a firm of construction Management consultants that specializes in the analysis and resolution of construction disputes.

*Sandwiches and coffee will be provided at 6.00 pm.  
Notice is required, please book ahead either by  
fac. to Micheal Wheeler at 252 0237 or to the  
Bankers Hall address above.*

### DESIGN AND CONSTRUCTION OF THE "SADDLEDOME"

**Friday, November 19th, at 7.00 pm.** at the Danish Canadian Club 727 11th Avenue S.W.

Speaker: **Ted Macaig** CEng, FISTructE., Principal of consulting engineers B.E.I. Engineering Inc. Calgary. Illustrated with slides, a presentation of the experience, and problems encountered in the design and construction of this sophisticated and complex building, home to the Calgary Flames.

(Notice not required.)

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**If you have any comments on the content of this newsletter, would like to contribute an article of either general or technical interest, promote a point of view, or advertise a service please write to me at the address above.**

**Martin Gough**, P.Eng., CEng. MICE. (Editor)