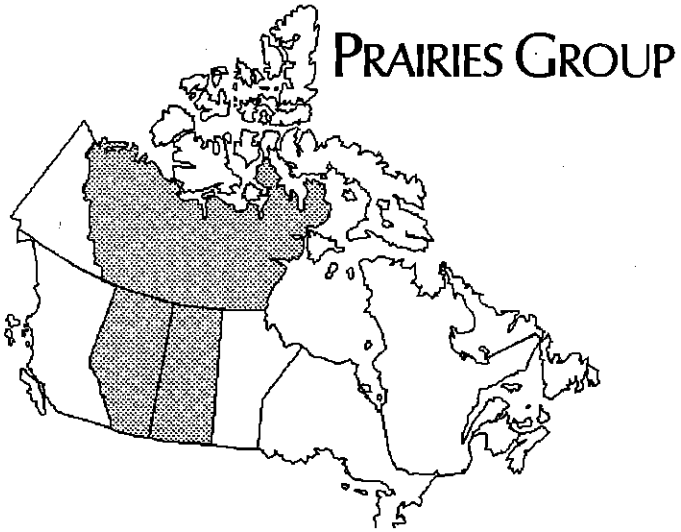
NEWSLETTER

FALL 1993

WESTERN CANADA GROUP OF CHARTERED ENGINEERS

CALGARY CHAPTER

Calgary Chapter to become Canadian Prairies Group



We have now received a letter from Vancouver which concurs with our plans to create the Canadian Prairies Group of Chartered Engineers. We will incorporate the Civils, Mechanicals, Electricals, Structurals and Chemicals in Alberta, Saskatchewan, and the Northwest Territories. Vancouver has been very supportive of our efforts and both groups believe that we will be able to respond to our member needs more closely than a group which has to spread itself out over two states, three provinces and two territories. We will be maintaining close links with Vancouver (which will still be known as the Western Canada Joint Group) and will be cooperating with them as much as possible to support our member's interests.

We have much to do to ensure that the transition occurs smoothly—for the first time we will have to prepare our own constitution and submit operating budgets directly to London for funding. We will model our constitution on that of Vancouver and will also formally be including the Chemicals and Structurals for the first time. We look forward to a strong turn out at this year's AGM to get our new group off to a strong start..

The AGM, which will be held at the Danish Canadian Club on 11th Avenue S.W., Calgary on the 1st of December beginning at 7.00 pm, will be the last for the Calgary Chapter before becoming the Prairie Group. Your committee will be reporting on their activities for the year and new committee members will be elected for the coming year. I look forward to seeing you there.

It will be at the AGM that we will formally welcome the members of the Institution of Structural Engineers and the Institution of Chemical Engineers into the Joint Group, and that we will look forward to becoming the Prairies Group—on the 1st of January 1994.

To allow proper consideration of these changes we will be holding an Extraordinary General Meeting on the February 25, 1994. You will shortly be receiving a copy of our new Group's constitution for your review. Please study it carefully. We have adopted a constitution based largely on that of the Vancouver Group. This document has worked well since 1987 and adopting the same provisions will allow the two separate groups to mutually support each other.

In addition to providing a strong technical programme and facilitating social get-togethers amongst members the Calgary Chapter has been able to assist members in their relations with the provincial engineering associations and also with job searches. In the future the Prairies Group will be looking for ways to improve our service to members living outside the Calgary

area. I will be visiting members in other locations and we will be appointing a committee member with particular responsibility for those members.. If you are interested in working with the committee to set up local activities please contact me.

IChemE
INSTITUTION OF CHEMICAL ENGINEERS
CHEMICAL

CIVIL

We are also establishing more open links with other learned societies since we believe that by co-operating with others we can provide stronger presentations than would otherwise be possible. Please support these events if you can. In the future we hope to organize joint technical presentations.

IEE
ELECTRICAL

On the subject of co-operation the Calgary Association for Medical Products (CAMP) has recently been formed. This group is attempting to bring together the disparate resources in the community to build a stronger base for the industry. The healthcare industry represents some 9% of Canada's GNP yet we supply only around 20% of our needs from domestic sources. There is a tremendous opportunity for engineers and entrepreneurs in Alberta to work with the existing infrastructure of Universities and hospitals and create more jobs and other economic benefits for the province. CAMP'S first technical session, *"ISO 9000 Medical Products - Myth vs Reality"* took place on November 3. Please contact me if you would like further information.

I MECH E
MECHANICAL

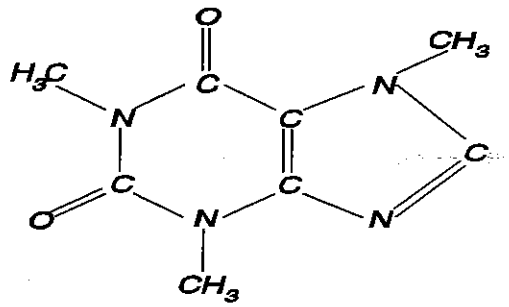
STRUCTURAL

Call David at 298 5710 (or fax. 298 3875)

Eur Ing **David Hood** Ceng. MIEE, MIMecE
Chairman

Institution of Chemical Engineers Formally Join Prairies Group

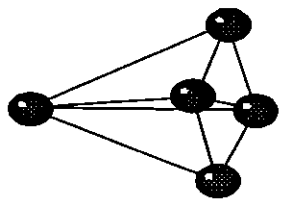
We welcome members of the Institution of Chemical Engineers to our Canadian Prairies Group of Chartered Engineers. (Yes, Chemicals are real engineers too!) There are approximately fifty members in our area with almost two thirds living in and around Calgary. We look forward to their presence at, and participation in our activities.



CAFFEINE

The Institution of Chemical Engineers has a world wide membership of 20,000. 30% of the membership is offshore from the U.K.—there are 2,000 members in Australia alone. The 2,000 female members whilst by no means representative of parity is a significant advance on the situation of twenty years ago.

The Institution headquarters are in Rugby. Some time ago they recognised the cost of maintaining a London base and so made the move. They still maintain a London office but the main business of the Institution is conducted from the Provinces.


JOINT GROUP

The Institution has in recent years made Process Plant Safety a major focus. It is now recognised as a world leader in that field. Hopefully some of that expertise can be made available to the membership of other disciplines in our joint group.

TECHNICAL MEETINGS NEWS

Design and Construction of an Ethylene Plant in Jilin City, N.E. China

38 members and guests enjoyed a presentation by **Mr. Ian Laird**, P. Eng., C. Eng., M.I. Mech.E. It was held on the evening of September 17th 1993 at the Danish Canadian Club.

Mr. Laird's presentation, illustrated with slides and overheads described his experiences during the design and construction of a $60 million Ethylene Oxide plant in a remote part of North East China. His talk covered both technical and cultural aspects of his experiences.

The life of the inhabitants of a Northern Chinese community and the primitive ways and methods involved in the construction of a major development were vividly described. The unique blend of western technology and the Chinese traditional work methods in the design , manufacture and erection of the main pressure vessel was a study in contrasts. It was interesting to see the construction site at Jilin City. We will not forget the piles of bricks evident in most construction scenes. We were appalled by the apparent lack of safety standards underlying the construction by the Chinese construction team. Even the commuting to and from the construction site with all the bicycles and pedestrians on those icy roads seemed a very hazardous occupation.

Our warmest thanks to Mr. and Mrs. Laird for providing us with such an interesting and informative evening. Mr. Laird was introduced by David Elson. The vote of thanks was proposed by Paul Camwell.

Avoiding Construction Disputes

24 members and guests attended a presentation by **Mr. Steve Revay** on the subject of 'Avoiding Construction Disputes'. It was held at the Danish Canadian Club on Thursday October 14th 1993.

Mr. Revay is the Vice President, Western Region, for Revay and Associates Limited. He gave an entertaining but sobering overview of the growing number of construction disputes. He also outlined some of the measures that could be adopted to avoid claims and/or costly and often unnecessary litigation.

As a result of the lively participation of the audience, Mr. Revay was unable to fully complete his intended presentation. However, as the topic generated considerable interest, Mr. Revay has kindly agreed to continue and to expand on the subject at a future technical meeting sometime in 1994.

Mr. Revay was introduced by Michael Wheeler. The vote of thanks was proposed by David Hood.

Design and Construction of the Saddledome

More than 20 members and guests were fortunate to hear a presentation on the design and construction of the Saddledome, home of the Calgary Flames and venue for the ice events in the 1986 Winter Olympic Games. The presentation, illustrated by slides, was ably given by **Mr. Ted Macaig**, C.Eng., F.I. Struct. E. who at the time was a senior partner in the firm of Jan Bobrowski and Partners Ltd., the structural engineers for the project.

Mr. Macaig described the background to the proposal for the stadium and the pressures to meet the requirements for the Winter Olympics and for the longer term hockey needs. He described with clarity and in considerable detail the unique design concepts used for the hyperbolic paraboloid roof construction. His slides showed graphically the practical ingenuity required for construction.

Structural and non-structural engineers alike enjoyed the presentation. To at least one non-structural engineer the presentation was a revelation. Now there will be something else to study and wonder at sitting at the next hockey game when things aren't going the way Flames fans would like.

Ron Girardeau introduced the speaker. Alistair Limpitlaw proposed the vote of thanks.

Future Technical Meeting

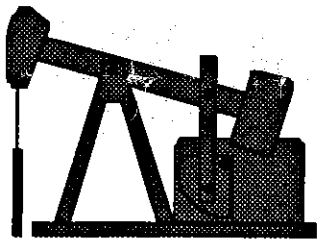
- Friday February 25th 1994, Danish Canadian Club Calgary, 7.00 pm. Dr. Gamil Tadros will speak on the subject of the Prince Edward Island 'Fixed Link' project.
- Friday March 18th 1994, Danish Canadian Club, Calgary. Dr. Francis Hartman will speak on the subject of 'New Canadian Contracting Methods'
- April (Provisional). Visit to the Calgary Herald.

Articles

HORIZONTAL WELLS: THE QUIET REVOLUTION

by **M.R. Milligan**, P.Eng., CEng., M.I.Mech.E

The oil and gas industry in North America has undergone significant changes over the last few years. Restructuring, downsizing and layoffs have become commonplace as the industry struggles to come to terms with the business realities of the 90's. These changes have been widely publicized and articles relating their impact are frequently published in local and national newspapers. Less well publicized but perhaps more significant, there has been a fundamental change in the way oil and gas wells are drilled and completed for production. Instead of drilling all wells predominantly vertically, more and more operators are drilling wells horizontally.



Why horizontally you might ask? The answer lies in understanding well productivity. Oil and gas production from permeable subsurface hydrocarbon bearing formation (rocks) is controlled by many factors but key are the formation's permeability (k) and thickness (h). By drilling horizontally through the oil and gas reservoir, we can significantly increase the amount of permeable rock available for flow or in technical terms effectively increase the well's (kh). Vertical wells can only penetrate the permeable reservoir rock over a thickness of a few to several hundred metres dependent on the thickness of permeable reservoir rock deposited. Whereas horizontal wells can be steered through the permeable reservoir rock for up to a thousand metres (or more). Therefore, horizontal wells produce significantly more oil and gas and can recover more reserves than vertical wells. Productivities of horizontal wells are typically four to six fold of those from equivalent vertical wells but up to tenfold may be attainable under ideal circumstances.

Some industry experts contend that by combining horizontal well and enhanced oil recovery technologies, the amount of oil recovered from conventional oil reservoirs could be doubled. Many reservoirs in Western Canada will only recover about 30 to 35% of the original oil in place with conventional recovery techniques such as waterfloods and vertical wells. By the application of horizontal wells combined with enhanced oil recovery techniques such as carbon dioxide (CO2) and ethane floods, this could be increased to 60 to 70% of the original oil in place. Although horizontal wells have been predominantly drilled in oil reservoirs, they are beginning to find increased application in gas reservoirs to boost gas deliverability and accelerate the recovery of gas reserves that otherwise might not be economic to recover.

As perhaps you might expect, horizontal wells are more expensive and in certain respects mor technically challenging to drill than vertical wells. Initially horizontal wells were very much the exception rather than the rule and horizontal wells would cost about double that to drill a vertical well. However, the drilling industry has climbed the learning curve fast such that less drilling problems are experienced and nowadays horizontal wells can be drilled for 30 to 50% more than vertical wells. But with the improved well productivities, the wells are paying out faster, enhancing cash flow and spurring the current mini-boom in drilling wells which we are currently experiencing in Western Canada. In many companies nowadays, instead of questioning why drill a horizontal well, the norm is horizontal and one has to provide a justification for drilling a well vertically (there are still applications for vertical wells).

Horizontal well costs have been further reduced by drilling what are called 'sidetrack re-entries'. In this technique, a vertical well is re-entered with a drilling or service rig, the steel casing is milled away and a horizontal well drilled (sidetracked) from the existing wellbore. As an example, drilling a horizontal oil well from the surface in Midale, Saskatchewan, costs about $500,000 to $600, 000 whereas a sidetrack re-entry well costs about $350,000.

In addition to improvements to drilling technology to drill horizontal wells with less problems and thereby less cost, wells are being drilled with less impairment or damage due to the drilling process. Conventionally, wells are drilled with a so-called drilling mud being circulated through the drill bit to transport cuttings to the surface and control the inflow of reservoir fluids (oil and gas). Therefore, drilling muds have been circulated which provide a hydrostatic pressure greater than the reservoir pressure

to ensure the well didn't overflow during drilling. These muds were also designed to lay down a filter cake to prevent loss of mud to the formation. In vertical wells the filter cake could be bypassed / removed by perforating and acidizing techniques. This is less straightforward in horizontal wells as many of them are not cased. Therefore, horizontal wells have driven the development of underbalanced drilling whereby the well can be produced in a controlled fashion during drilling. This reduces damage to the wellbore and enhances the well's productivity. Other innovations being driven by the boom in horizontal drilling are vertical wellbore, jetting horizontal holes using high pressure jets on the end of flexible continuous tubing. Horizontal wells have revolutionized the way drilling and other petroleum engineers view producing and recovery hydrocarbon from reservoirs . Old paradigms are being smashed, new technologies developed and increased revenues realized from horizontal wells.

Courses

PROJECT MANAGEMENT SPECIALIZATION LAW FOR PROJECT MANAGERS

by **George Jergeas** Ph.D., P.Eng
Senior Consultant, Revay and Associates Ltd.
and Adjunct Assistant Professor
Dept. of Civil Engineering, University of Calgary

The Project Management Specialization at the University of Calgary offers eight courses aimed at training and educating practising project managers and key project management support personnel in those areas recognized by industry as essential for the effective execution of capital projects.

The courses have been developed in close cooperation with industry. Course material has been prepared by active senior practitioners who are recognized leaders in their field, working closely with University Faculty.

Courses offered are:

- Fundamentals of Project Management
- Project Planning and Control
- Project Engineering Management
- Project Construction Management
- Project Procurement and Logistics
- Project Human Resources and Organizational Effectiveness
- Project External Issues
- Law for Project Managers

Each course is organized by a lead instructor with guest lectures participating in various sessions. The formal lecture content is supplemented with student reviews and critiques of actual projects as well as case studies which examine problems in actual project situations.

These courses are offered cooperatively by the Faculties of Engineering and Management, so participants can benefit from the expertise of academic staff in a variety of disciplines.

The newest of the above listed courses is the Law for Project Managers. This course is intended to provide an understanding of the legal issues relevant to the Project Manager. Emphasis is placed on exploring the practical application of the legal principles through group and individual assignments based on legal precedent and real life construction disputes. Topics include tendering, contract laws, the role of project manger, tort, bonding in the construction industry, lien legislation, industrial and employment law, environmental law issues, insurance, alternative dispute resolution and mock arbitration.

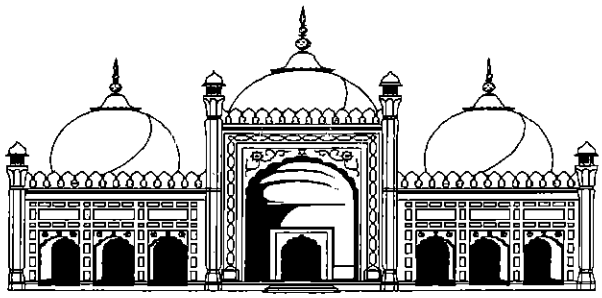
Because the number of claims and litigations have been increasing and become a time consuming and costly element in construction projects in North America, the course places emphasis on the role of the project manager. Emphasis is also placed on proactive actions to avoid claims and disputes mainly by properly managing projects and using non-adversarial communication with other parties involved in the projects.

Social

ANNUAL DINNER TO BE HELD AT TAJ MAHAL RESTAURANT

All members and their Guests are welcome to the Annual Dinner of the Canadian Prairies Group of the Joint Group which this year will be held on **January 22, 1994**, at the

Taj Mahal Restaurant, 4816 Macleod Trail South, Calgary.



Not as illustrated

The Cost will be **$15.00 per ticket** which includes a buffet Indian meal and table wine. There will be a cash bar.

Cocktails will be at 6.30 p.m. for dinner at 7.30. p.m.

For those who prefer, Western style food will be available but only for those who include that request with their ticket purchase.

The space is limited to a maximum of 150 people. This promises to be an excellent evening so get your cheque (payable to the Western Canada Joint Group of Chartered Engineers) as soon as possible to:

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

For further information call Bob Owens at 938 3469 (res) or 237 2573 (bus.)

***From the editor*:**

The next Newsletter will be circulated in Spring 1994 to the approximately 600 Chartered Engineers on our membership lists.

If you have any comments on the content of this newsletter, or have an article, an opinion, or information that you would like to have included in our next newsletter then call me at 262 4500, or fax. to 269 7640.

Martin Gough.