Conventional Heavy Oil
Drilling
e-Business
Environmental
Fundamental Research
Health and Safety
Inactive Well Management
Natural Gas Production
Oil Production
Oil Sands
Reservoir Recovery / Geoscience
Well Completion

Facilitating Innovation, Technology Transfer and Research & Development in the Upstream Oil & Gas Industry
PTAC continued to grow in 2000 and realized several significant milestones. We added 60 new members, hosted 30 Technology Information Sessions, sponsored 9 workshops and forums and facilitated the launch of a record 38 R&D projects valued at $30.8 million. PTAC has facilitated the launch of 89 R&D projects valued at $42 million since inception in 1996. The results for many of these projects have been provided to funders and whenever possible, been made available to the public via our website.

In December 2000, PTAC and Gas Technology Inc. (GTI) signed a three-year contract for PTAC to provide a Canadian Regional Technology Transfer Agent (RTTA) Program for natural gas. This has resulted in a significant expansion for PTAC with the establishment of a Natural Gas Technology Centre and the hire of three additional staff. We recently moved to new office space to accommodate the expansion and to co-locate with GTI.

PTAC hosted our first safety event, a forum on “Ways and Means to Reduce Wildlife/Vehicle Strikes on an Industry-Wide Basis.” The response to this and subsequent driving safety events has been very positive.

Two Environmental research groups, the Soil Long Term Planning Committee and the Salinity Working Group, were formed in 2000 to provide direction on research needed in these technical areas.

Our collaborative approach to challenges faced by the industry has proven to be very effective in facilitating innovation and change with a diverse group of stakeholders.

On behalf of the Board, we would like to express our appreciation to PanCanadian Petroleum for the provision of office space and services support to PTAC since December 1998. This support has been instrumental to our success over the past two years. We would also like to thank PTAC staff and volunteers for their contribution to the planning and holding of events and the initiation of new R&D needed by the Canadian upstream oil and gas industry.

Eric Lloyd
President of PTAC

Alan Archibald
Chairman of PTAC
PTAC facilitated the launch of 38 projects valued at $30.8 million during 2000. For further information, please refer to our 2000 newsletters or to the project index on our website (www.ptac.org/projects1.html).

### Conventional Heavy Oil
- Progressive Cavity Pump Run-Life Improvement
- Vapex Engineering and Economics - Phase 3
- Foamy Oil Behaviour: Beyond the Cold Production Process
- Cyclic Solvent-Based Process for Heavy Oil Reservoirs
- SAGD Application in Reservoirs with Depleted Gas Caps
- Characterization of Conventional Oil and Gas, Heavy Oil and Bitumen Formations using Low Field NMR Spectroscopy*
- Asphaltenes Deposition*
- Intermetallic-Based Alloy-Coatings on Steel Structures Used in Oxidation, Sulphidation and Carburization Environments*
- Enhanced Oil Recovery by Unrease-Catalyzed, Microbial Calcium Carbonate Blocking*
- In-Line Multiphase Flow Meter Development*
- Performance Evaluation of Shale for Ensuring Hydraulic Isolation around Thermal Wellbores*

### Drilling
- Evaluation of Coiled Tubing Serviceability for Sour Service Applications
- Borehole Stability and Sand Production Risk Assessment Software – Phase 2
- A New Measurement while Drilling Surveying Technique Employing the Technology of Fiber Optic Gyroscope in a Strap Down Inertial Navigation System*

### Environmental
- Options for Conventional Heavy Oil Vent Gas Utilization and Mitigation
- Flaring Technology Field Test Facility: Phase 1a – Flaring Mitigation Centre Market Assessment
- Flare Speciation - Part I
- Flare Performance - Part I
- Flaring – Improved Liquid Separation
- Flaring – Alternate Technologies – Part I
- Fugitive Emissions

### Natural Gas Production
- Optimization of Steam Generator Performance*

### Oil Sands
- Geotechnical Behaviour of Oil Sands Paste Tailings/Geotechnical Physics of Producing Thickened Tailings (Paste)*

### Conventional Heavy Oil
- Thermal Solvent Process – Field Scale Engineering and Economics
- In Situ and Refinery Upgrading of Vapex Heavy Oil Production for Increased Value and Reduced Emissions (VAPEX Phase 2)
- Vapex Refinery Upgrading Project
- Heavy Oil Vent Gas Utilization

### Environmental
- Fundamental Study of Bitumen Digestion Process*
- Development of a New Technology to Improve the Equipment Utilization Rate in Mining Operations*
- Research into Cold (25°C) Conditioning of Oil Sands with Regard to Solids Reduction in Frth through Solvent/ Denulifier Nascent Froth and Naphtha/Paraffinic Diluent Post-Production Froth Treatment Schemes*
- At Face Slurrying: Advancing Innovative Technology for Oil Sands Production*
- Impact of Residual Bitumen Removal Methods on the Separation of Heavy Minerals in the Oil Sands Tailings*

### Reservoir Recovery / Geoscience
- Enhanced Waterflooding using Toe-to-Heel Displacement
- Improved Water Production Prediction in Carbonates
- Seismic Velocity Anisotropy and Depth Imaging*
- Evaluation of Miscible and Submiscible Flue Gas Injection for Improved Recovery of Light Oils and Sequestering of Green House Gases*

### Well Completion
- Gel-Foam Applications
- Water Abatement in Gas Reservoirs

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* Launched in conjunction with Coordination of University Research for Synergy and Effectiveness (COREUSE)
** Results completed and reported to funders in 2000
PTAC expects the RTTA Program for natural gas to generate considerable demand for technology transfer events and information that will assist in the challenge of expanding an economical and environmentally friendly supply of natural gas for North American energy markets. The additional capability provided by the program to PTAC members and industry is expected to expand our role as a facilitator and increase the value that stakeholders realize from our services.

PTAC recently initiated a widespread survey on Canadian upstream oil and gas technology and research needs and expertise across all technical areas. The survey results will be utilized by PTAC to determine priorities for events and initiatives, and be incorporated into an overall R&D Strategy document. We plan to release the requirements for utilization by government, academia and industry in an effort to facilitate the required R&D related investment, initiatives and resulting application of new technology.

We expect to see new technical groups or initiatives in the areas of: flaring; greenhouse gas (GHG) and fugitive emissions; human, ecological and animal health; heavy oil enhanced recovery; driving safety; and fundamental research.

We have set a goal of launching a minimum of 30 projects with a value of $10 million in 2001. We are predicting a significant increase in our annual budget to $1 million based on the RTTA Program funding and our growing membership and event revenue. PTAC will continue to encourage member participation in workshop and forum planning to ensure collaborative R&D is focused on relevant issues.
Auditor’s Report

We have audited the financial statements of PTAC Petroleum Technology Alliance Canada for the year ended December 31, 2000 and have reported thereon without reservation under date of January 19, 2001. The accompanying summarized balance sheet and summarized statements of revenues, expenses and surplus have been prepared from the audited financial statements.

In our opinion, the accompanying summarized balance sheet and statements of revenues, expenses and surplus fairly summarize the information as to the financial position of PTAC Petroleum Technology Alliance Canada and the results of its operations contained in the audited financial statements.

Hamilton Rosenthal
Chartered Accountants
Calgary, Alberta

Auditor’s Report
Financials

Summarized Balance Sheet
As at December 31, 2000, with comparative figures for 1999

<table>
<thead>
<tr>
<th>Assets</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash</td>
<td>$27,672</td>
<td>$20,843</td>
</tr>
<tr>
<td>Marketable securities</td>
<td>46,639</td>
<td>43,896</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>52,686</td>
<td>46,049</td>
</tr>
<tr>
<td>Prepaid expenses</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>127,609</td>
<td>110,788</td>
</tr>
<tr>
<td>Capital assets</td>
<td>$39,900</td>
<td>$28,661</td>
</tr>
<tr>
<td></td>
<td>$167,509</td>
<td>$139,449</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Liabilities and Surplus</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable, accrued liabilities</td>
<td>$11,093</td>
<td>$341</td>
</tr>
<tr>
<td>GST payable</td>
<td>5,133</td>
<td>-</td>
</tr>
<tr>
<td>Deferred revenue</td>
<td>148,227</td>
<td>121,035</td>
</tr>
<tr>
<td>Payable to members</td>
<td>3,493</td>
<td>16,050</td>
</tr>
<tr>
<td></td>
<td>167,946</td>
<td>137,426</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Net Assets</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invested in capital assets</td>
<td>39,900</td>
<td>28,661</td>
</tr>
<tr>
<td>Unrestricted</td>
<td>(40,337)</td>
<td>(26,638)</td>
</tr>
<tr>
<td></td>
<td>(437)</td>
<td>2,023</td>
</tr>
<tr>
<td></td>
<td>$167,509</td>
<td>$139,449</td>
</tr>
</tbody>
</table>

Summarized Statement of Revenue and Expenses
Expenses and Surplus for the year ended December 31, 2000, with comparative figures for 1999

<table>
<thead>
<tr>
<th>Revenues</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Membership</td>
<td>$337,582</td>
<td>$336,992</td>
</tr>
<tr>
<td>CAPP</td>
<td>35,000</td>
<td>-</td>
</tr>
<tr>
<td>Events</td>
<td>21,135</td>
<td>-</td>
</tr>
<tr>
<td>In-kind revenue</td>
<td>12,000</td>
<td>11,500</td>
</tr>
<tr>
<td>Interest income</td>
<td>4,021</td>
<td>3,086</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>14,586</td>
</tr>
<tr>
<td></td>
<td>$409,738</td>
<td>$351,578</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expenses</th>
<th>2000</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating</td>
<td>$412,198</td>
<td>$368,985</td>
</tr>
<tr>
<td>Excess (short) of rev/exp.</td>
<td>(2,460)</td>
<td>(17,407)</td>
</tr>
<tr>
<td>Surplus, beginning of period</td>
<td>2,023</td>
<td>19,430</td>
</tr>
<tr>
<td></td>
<td>$437</td>
<td>$2,023</td>
</tr>
</tbody>
</table>

The complete audited financial statements of PTAC for the year ended December 31, 2000 are available from PTAC offices upon request.
An Association that Facilitates Innovation, Technology Transfer, and Research & Development in the Upstream Oil & Gas Industry

PTAC has 12 Technical Areas of interest and over 3600 contacts:
- Conventional Heavy Oil
- Drilling
- e-Business
- Environmental
- Fundamental Research
- Health and Safety
- Inactive Well Management
- Natural Gas Production
- Oil Production
- Oil Sands
- Reservoir Recovery / Geoscience
- Well Completion

PTAC requires participation from senior technical people to identify important issues that require technology transfer or R&D. If you are interested in participating, or seeing particular issues addressed, we encourage you to contact PTAC to provide input or to obtain additional information.

PTAC sponsored workshops to provide opportunities for people to clearly define R&D issues and identify potential solutions and the best approach to move forward. Potential suppliers of R&D have the opportunity to hear first hand about such issues and to contribute their expertise and ideas for solutions. PTAC hosts the workshops and provides the necessary facilitation, administrative support and coordination to launch projects. When required, PTAC widely distributes Request for Proposals (RFPs) with Expressions of Interest for each priority issue from workshops. Once we have identified those who will consider supporting the R&D, proposals are then solicited from potential suppliers. PTAC brings together the interested organizations in a structured way that leads to new R&D, while protecting proprietary interests.

In 2000, PTAC sponsored four workshops in Drilling, Environmental (Flaring and Soil Remediation) and Reservoir Recovery. Forums that are focused on a specific need or technical area are conducted to communicate information on new technologies or case studies, or on the objectives and results of current research.

Five forums were held in 2000: the Annual Environmental Forum, Flare Gas Incineration, Health and Safety, Conventional Heavy Oil and e-Business.

Over 700 people participated in these nine workshops and forums held in 2000.

The continued involvement of industry personnel is needed by PTAC in 2001 to plan workshops or forums in areas such as Environmental, Drilling, Heavy Oil, Natural Gas, Well Completion, and Reservoir Recovery. We encourage you to contact PTAC if you have ideas for such workshops, forums or working groups.

PTAC believes that working with industry associations and regulators to jointly plan and sponsor events and distribute information is an important component of the overall approach to collaborative R&D and technology transfer.

When our approach yields potential solutions to industry challenges that are not R&D related, PTAC will transfer those items to interested associations or regulators for their further development and implementation.

For further information please contact:

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fax: (403) 263-3041

development.

PTAC hosted 30 Technology Information Sessions attended by a total of over 800 participants in 2000. These sessions provided our members with the opportunity to obtain funding and technical input for proposed R&D, learn about new R&D initiatives and emerging technology, report on project and field test results, and transfer and market new technology in the conventional oil and gas industry.

If you have a particular technical focus area that needs to be addressed, please contact PTAC with your ideas.

Workshops and Forums

Workshops and Forums

PTAC hosted 30 Technology Information Sessions attended by a total of over 800 participants in 2000. These sessions provided our members with the opportunity to obtain funding and technical input for proposed R&D, learn about new R&D initiatives and emerging technology, report on project and field test results, and transfer and market new technology in the conventional oil and gas industry.

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