



Association of Professional Engineers of Yukon
ASSOCIATION NEWSLETTER

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Fall Issue, 2005



Yukon's Climate Can Be An Engineering Challenge

A rare photograph of a funnel cloud taken north of the Yukon River about 32 kilometers (20 miles) northeast of Carmacks, Yukon on June 15, 2005. The difference between a funnel cloud and a tornado is that a tornado touches ground level while a funnel cloud does not. For more information about climate and its implications for engineering see page 8 in this newsletter. This photograph is published with the kind permission of Mr. Andy Robin.

Internationally Trained Workers Initiatives

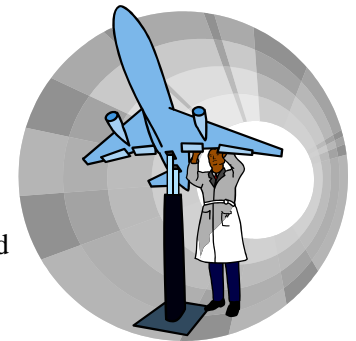
Editors Note—*The following bilingual speech by Marie Lemay, P. Eng., ing. (CEO-CCPE) was given on April 25, 2005 at the COSTI Corvetti Education Centre, in Toronto, Ontario at the invitation of Human Resources and Skills Development Canada to mark the announcement of the federal Internationally Trained Worker's Initiative. The speech focuses on the FC2I initiative (From Consideration to Integration Project) and some of its recommendations. For more information about the FC2I initiative go to www.ccpe.ca and follow the links or contact APEY.*

Ms. Marie Lemay's address: Honorable Minister Tony Ianno, Madame la ministre l'honorable Lucienne Robillard, Honorable Minister Joe Volpe, ladies and gentlemen, Mesdames et messieurs, on behalf of the Canadian Council of Professional Engineers (CCPE), I thank you for inviting us to take part in today's Internationally Trained Workers Initiatives Announcement.

The successful integration of international graduates in our society is very important to the engineering profession. For decades, we have been licensing international engineering graduates (IEGs). *As regulators of the engineering profession, Canada's engineering licensing bodies need to be involved in assisting them in their settlement process in Canada.*

Depuis les dix dernières années, le niveau d'immigration au Canada, incluant celui des personnes formées en génie à l'étranger, est demeuré élevé. Selon le sondage national du Conseil canadien des ingénieurs, 12 pour cent des 160 000 ingénieurs au Canada ont reçu leur formation en génie à l'étranger.

However, we know that other international engineering graduates have been unable to obtain their P.Eng. license and gain employment as professional engineers in Canada. We, both at CCPE and at the provincial and territorial regulatory bodies, know this not just from media reports but from talking directly to immigrant engineers and hearing about their difficulties. In January 2003, the engineering profession in Canada as a whole decided to act proactively on the issue of the integration of international engineering graduates and started the *From Consideration to Integration* or FC2I initiative. The first two phases of this project were fully funded by Human Resources and Skills Development Canada with a considerable in-kind contribution from hundreds of people. Its goal is the development of new processes and/or the improvement of current processes by which international engineering graduates (IEGs) are able to obtain engineering licences and to find meaningful engineering employment, without compromising public safety or lowering professional standards.



In May 2004, the Board of Directors of CCPE, approved unanimously, the 17 recommendations from the FC2I Phase II project report. For this initiative to be successful, the leaders of the engineering profession recognized that there was a need to look at activities taking place prior to immigration to Canada as well as the processes of getting licensed and finding suitable jobs. We didn't want this to be a project by engineers for engineers. This is why it was important to work in partnership with various immigrant serving agencies across Canada such as COSTI, as well as the provincial and territorial licensing bodies, different levels of government, educators and employers.

De la considération à l'intégration, un projet dont les deux premières phases ont été financées en totalité par Ressources humaines et Développement des compétences Canada vise à élaborer et/ou à améliorer les approches et les modèles à partir desquels les personnes formées en génie à l'étranger obtiennent leur permis d'exercice de la pratique du génie ainsi qu'un emploi, et ce sans abaisser nos normes professionnelles et mettre en jeu la sécurité du public.

One of the key recommendations that came out of the project is the development of the International Institution and Degree Database on Foreign Engineering Credentials. This project, the first phase of which received funding from HRSDC in late winter, will facilitate the process by which foreign credentials are recognized and will provide more consistency of treatment by the regulatory bodies across the country.

During stage one of the development of the database, the goal is to define the criteria that will govern how an educational institution is placed in the database, and how that information will be used to facilitate consistent assessments of international engineering graduates' applications for licensure in the provinces and territories. We also want to ensure that international graduates who don't qualify to get their P.Eng. licenses here in Canada will nevertheless find meaningful roles within the engineering team. All Canadians will then benefit from their contributions to our society since immigrants will enjoy greater options in employability, while ensuring that employers have access to a diverse pool of talent. We will do this by providing additional information and referrals to licensure applicants who, for whatever reason, do not meet the Canadian engineering licensing requirements.

Looking forward, we are working with HRSDC to define the scope for a labour market study. This project will provide us with invaluable information on engineers, technicians and technologists, and allow us to draw a clearer image of engineering needs in Canada. In the end, it will help us to better inform prospective immigrants about job opportunities in the various regions of Canada.

In closing, the engineering profession, 160,000 strong across Canada, believe that it is very important that the federal government continue to fund projects like the ones described today. We need to address the integration of international engineering graduates in collaboration with all levels of government, licensing bodies, settlement agencies and employers, as this is a multi-jurisdictional issue. To reach our common objective will take vision, determination, funding and time. Steps have to be taken to develop an effective roadmap so that duplication of efforts can be avoided and safety nets built. We are now following that roadmap developed through the FC2I project by implementing the project recommendations. We cannot, and with the help of government and the other stakeholders, will not, stop until significant progress has been made. These are very exciting times - not just for engineers - but also for all Canadians. Together, stakeholders are making important progress, and I look forward to working with them as we continue to work towards our common objective.

Thank you. Merci beaucoup.
Marie Lemay, P. Eng., ing.

2006 Bridge Building Competition!!

As part of National Engineering Week (NEW) the APEY organizing Committee is hard at work planning the 13th Annual Bridge Building Competition. This very popular event will be held **Saturday, April 8th, 2006** at the Porter Creek Secondary School in Whitehorse.

If you are interested in being part of the competition give us a call at 667-6727.



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Innovators in the Schools

Heather Dundas

Professional Practice and Ethics Exam Subjected to Validation Survey

During the first half of 2005, the National Professional Practice Examination Advisory Committee (NPPEAC) undertook a validation survey to assess the suitability of the syllabus of the national Professional Practice Examination, as it relates to the day-to-day professional practice of individual engineering and geoscience practitioners.

The survey consisted of 37 questions, based on the current NPPE syllabus topics. Respondents were asked to consider the relevance of each topic in relation to the practice of their profession and the ethical issues and challenges that they may encounter, and to rate each topic on a 4-point scale, ranging from “useless— should be deleted from the syllabus” to “essential—must know”. In addition, respondents were invited to write unstructured responses to each of the questions.

A total of 1,557 professional members, from the 10 Associations across Canada which use the national exam responded to the survey, - 1225 professional engineers (78.9%) and 299 professional geoscientists (19.2%). An initial review of the responses indicated that most respondents considered the topics in the current syllabus to be either “essential—must know” or “generally important and useful for members to know”.

A comprehensive analysis of the survey responses will be undertaken this summer and a full report complete with recommendations will be completed in the fall. In the meantime, the NPPEAC, wishes to extend its sincere thanks to all of the professional members who participated in the survey.

The NPPEAC is a national committee made up of the 10 professional associations—engineering only, combined engineering and geoscience, and geoscience only—which use the National Professional Practice and Ethics Exam as their method to verify practitioners entering the practice of professional engineering or professional geoscience have an appropriate knowledge and understanding of both their professional and ethical obligations.

For more information contact:

Milt Petruk, P. Eng. (APEGGA) - NPPE Exam Coordinator at 1-800-661-7020;

or

Oliver Bonham, P. Geo. (APGO) - NPPEAC Chair at 416-203-2746 Ext 22



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For further information, or application forms, contact:
CCPE National Scholarship Program

Canadian Council of Professional Engineers
1100-180 Elgin Street, Ottawa, Ontario K2P 2K3

Tel: (613) 232-2474 Fax: (613) 230-5759

E-mail: awards@ccpe.ca

Forms are available on the CCPE Web site at:

www.ccpe.ca

APPLICATION DEADLINE: March 1, 2006



CANADIAN COUNCIL OF PROFESSIONAL ENGINEERS
CONSEIL CANADIEN DES INGÉNIEURS



Meloche Monnex

Registrar's Report

The Board of Examiners (BOE) meets the 2nd Tuesday of every month. In addition to reviewing and approving applications for Membership and *Permits to Practice*, the BOE provides comments on draft Canadian Council of Professional Engineers (CCPE) guidelines for admission, and other related committee work.

Current APEY membership is: 422 Members, 2 L.L.Eng., 12 E.I.T., 22 Retired Members and 2 Life Members.

Members Accepted Since February, 2005

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Soolim Co

Gregory G. Haist

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Guenter Schaub

Joanna Louise Shewen

Retired Member Status - Donald De Laporte, P. Eng.

Deceased Member

It is with regret that APEY announces the passing of Joseph Alexander Riddell, P. Eng. Joseph (Joe) first experienced the world of mining in 1951 at United Keno Hill Mines (\$1.20/hr. + mines bonus) and was so taken with the process that he became a mining engineer—and a proud, life-long member of APEY. Although he and his family left Calumet in 1963 (3 children then, 2 more later), they had made good friends and Yukon always held a special place in their hearts. Joe and his wife Isabelle last returned with two grandchildren for a visit in 1998. Any message for the Riddell family would be gladly received at cmriddell62@hotmail.com.

A list of APEY Active Members, Limited License Members, Engineers-In-Training, Retired Members and Life Members can be viewed on the APEY website at: www.apey.yk.ca



Permit to Practice

Beginning in January 2003, partnerships, corporations and other such entities which practice engineering in the Yukon now require a Permit to Practice. The Engineering Professions Act does not differentiate between the size of a company or whether the company is practicing for internal or external reasons. It is really quite straightforward - if you are practicing engineering you require a **Permit to Practice**. Information and applications forms for the Permit to Practice are available on the APEY website at www.apey.yk.ca



Companies with current *Permit to Practice* may update their stamps to include the company's name. The cost will be \$45.00 per stamp (includes GST). Please contact the APEY office for further details.

Permit to Practice Holders Approved Since February 2005

PP116 Falcon Engineering Ltd.	PP128 Pottinger Gaherty Group
PP117 Avento Consulting Inc.	PP129 Alfrey Engineering Ltd.
PP118 VB Cook Co. Ltd.	PP130 AMEC Earth and Environmental
PP119 SteveHan Consultants Inc.	PP131 J.P. Pinard Consulting Engineer
PP120 RJF Design Ltd.	PP132 Seacor Environmental
PP121 Steven Lee, Sole Proprietor	PP133 Hatch Acres Incorporated
PP122 Yukon Zinc Corporation	PP134 Butler Buildings (Canada)
PP123 All North Consultants Ltd.	PP135 Jacques Whitford Ltd.
PP124 VP Buildings Inc.	PP136 CTM Design Services Ltd.
PP125 Siefken Engineering Ltd.	PP137 Associated Engineering Alberta Ltd.
PP126 A. Young Engineering Ltd.	PP138 New Era Engineering Corp.
PP127 Construction Consulting	PP139 Firth Hollin Resource Science Corp.

Permit to Practice Struck From Registrar

PP030 Williams Projects Ltd.	PP059 Tower Engineering Group
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APEY to Host the 2006 CCPE AGM

From June 1-3, 2006 the Association of Profession Engineers of Yukon (APEY) will host the *Canadian Council of Professional Engineers (CCPE) and Constituent Members Annual General Meeting*. Engineers and their guests from every territory and province in Canada will participate.

As host, APEY will coordinate some of the events associated with the CCPE Annual General Meeting including the *Accompanying Guest Program* and a *Fun Night* for delegates and their guests. Tickets to attend these two events will be available to APEY members closer to the AGM. If you would like to get involved or would simply like to learn more about the CCPE AGM program contact APEY.



ENGINEERS AND CLIMATE CHANGE: WHAT YOU NEED TO KNOW*

There's no doubt about it: Climate change *is* happening. But what are the implications for engineering, and how will engineers take this new dynamic into account in ways that are cost effective and protect the public?

BY DAVID LAPP, P.ENG.

Florida experienced four hurricanes in a span of six weeks this past fall. Edmonton had two once-in-100-years storms in two weeks, followed by a hail storm that required backloaders to clear away the debris. Something is going on. But what?

The "what" behind these weather events is climate change, an emerging issue that will become an integral part of many areas of engineering practice. While the full implications are not yet known, engineers will need to consider the impact of climate change on engineering works in the interests of public health, safety and welfare—the cornerstones of professional engineering.

What is climate change?

Climate change is concerned with changes in key climate variables: temperature, precipitation, atmospheric moisture, snow cover, sea level and the extent of land and sea ice. It also involves the changing patterns in atmospheric and oceanic circulation, extreme weather events and long-term climate trends.

Climate change is affected by radiation that is received or retained in the atmosphere, and the redistribution of energy within the atmosphere and among the atmosphere, land and oceans. Greenhouse gases (GHGs) have long been blamed for climate change, of course. But many other natural and human factors, such as volcanic activity and tropospheric aerosols (very fine particulate suspended in air), and the combustion of fossil fuel, have an impact on global temperatures, too. How all of these factors affect climate change varies (Figure 1).

Is it really happening?

Climate change is a naturally occurring phenomenon and Earth has experienced many different climate regimes throughout geological history. The question is whether what's happening now is really different than this naturally occurring phenomenon. The answer is yes.

Ice cores tell the story. Ice cores show a direct relationship between atmospheric temperature changes and changes in GHG levels. During the past 10,000 years or so, atmospheric CO₂ concentrations have remained at close to the typical interglacial concentration of 280 parts per million (ppm). However, about 200 years ago things began to change. Concentrations of GHGs began to increase rapidly, primarily due to emissions from the combustion of fossilized carbon in coal, oil and natural gas and, to a lesser extent, land use change activities (Source: CDIAC website at <http://cdiac.esd.ornl.gov/trends/trends.htm>). Today, concentrations are at about 375 ppm—more than 30 per cent above pre-industrial era levels. This concentration appears to be unprecedented in the 400,000-year ice-core records, and has catapulted us so far out of the known historical ranges that we're not sure what all of the impacts will be.

Factor	Temperature	Timescale
Greenhouse gases	Increase	Decades/centuries
Ozone depletion	Increase	Decades/centuries
Tropospheric aerosols/sulphur	Decrease	Weeks
Volcanic activities	Decrease	Years
Nuclear explosions/asteroids	Decrease	Immediate
Land use changes	Either	Varies
Changed solar output	Either	Varies
Ocean circulation	Either	Varies

Figure 1: Impact on global temperatures



Some impacts are beginning to show, however. The global mean surface temperature of the Earth (combined land/ocean) is rising. Between 1919 and 1945 there was a pronounced warming, followed by a modest cooling between 1945 and 1975. Since then, there has been a return to rapid warming, and the rate of warming for the past 30 years is somewhat greater than for the earlier warming period. So, what does all of this mean? Simply, that the world is going to become much, much warmer during this millennium. Even with the most optimistic estimate, the projected warming by 2100 is likely to be unprecedented in human history.

Sea ice will retreat, particularly in summer. Sea levels will rise due to thermal expansion of the warmer water, receding mountain glaciers and large-scale melting of the polar ice sheet. The Intergovernmental Panel on Climate Change (2001) estimates a global sea level rise of between 9 and 88 cm by 2100. Due to the slow response of oceans to climatic changes, sea levels will continue to rise for centuries, causing many flooding events. Extreme weather events will increase in frequency and intensity. Climate change impacts and effects will be highly variable and localized. Some areas are projected to be colder than at present, but overall and in some areas our temperatures will be warmer.

At what cost?

The cost of climate change to society is difficult to predict, but there are some indicators. For example, insurance claims for property loss have grown exponentially since the 1950s, and 85 per cent of them are weather-related. According to Bruno Porro, chief risk officer, Swiss Re, "The world is entering a future in which risks are more concentrated and more complex. That is why we are pressing for policies that reduce those risks through preparation, adaptation and mitigation. That will be cheaper than covering tomorrow's losses after disaster strikes."

Implications for engineering

As engineers, we don't necessarily care why climate change is happening. We just need to know that it is, because there will be many implications. For example, there will be increased capacity demands on sewage and water control, pressures on source water resources, and degraded water quality. Climate change will have social and economic impact (e.g. tourism and recreation). The consequences for human health may include more vector- and water-borne diseases, extreme heat and cold events, and deteriorated air quality. In terms of the environment, there may be changes in the frequency of forest fires, disease, insect infestation, and the nature of and distribution of forests. Some plants and animals may be stressed to the point of extinction.

For example, there will be increased capacity demands on sewage and water control, pressures on source water resources, and degraded water quality.

Because so much of the world will be affected, so too will much of the engineering profession. Most engineering disciplines will be touched by climate change, including civil, geotechnical, municipal, environmental, hydrotechnical, mining, materials, and structural. This is by no means an exhaustive list.

Specifically, climate change will have major effects on the development of building standards and environmental regulations. In turn, engineers will have to learn to interpret these new standards and regulations properly.

Building condition and monitoring will change, and so will the whole building design approach, including risk management (screening, evaluation and retrofitting for existing buildings).

It will not be enough for research and development to focus just on technically acceptable solutions, but it will also have to have a greater focus on financially and socially acceptable solutions that have environmental benefits.

It will be necessary to consider the impact of climate change on the design life of engineering works. Works with a design life of 20, 30 or 50 years will likely see significant changes in the climate in their lifetimes—changes that will need to be considered in their design and operation over a complete life cycle.

Mitigation and adaptation

Addressing climate change through engineering will require a combination of two strategies. The first, mitigation, will slow the rate of climate change and may take the form of new techniques in the design, construction, maintenance and renewal of buildings for the purpose of reducing GHGs. The second, adaptation, will require the adjustment of systems in response to actual or expected climate changes. This, too, will require the use of new techniques for the design, construction, maintenance and renewal of buildings, but with the objective of preparing for the increased probability and consequences of severe natural hazards as a result of climate change.

All parties to the UN Framework Convention on Climate Change (Kyoto) have a requirement under articles 4.1 and 4.8 to assess their national vulnerability and develop strategies for adaptation to climate change. They are also required to invest in climate research and integrated risk assessment, and to communicate this knowledge both nationally and internationally. The first report is due this year.

The Conference Board of Canada, one of Canada's foremost independent organizations in the areas of applied research in economic trends and public policy issues, concluded in a recent

Continued on page 10

report that, "Canada will continue to experience the impacts of climate change regardless of any actions it takes to reduce its own emissions. It will, therefore, be important to provide adequate resources for adaptation: actions that can assist communities and regions that are likely to suffer the negative impacts of a changing climate."

Some examples of adaptation strategies that engineers will want to consider include:

- developing an approach and practices for protecting and improving existing construction against effects of climate change;
- developing an approach and practices for design, operation and maintenance of new buildings (such as additional cooling requirements in the summer and heating in the winter);
- revising codes, such as flood plain mapping, climate data and return frequencies for hazard-prone areas to adjust to new realities (e.g. higher snow and wind loads, once-in-100-years floods that have become once-in-10-years floods);
- considering land use restrictions on new construction, especially for flood plains, coastal shoreline and landslide-prone areas.

Some strategies may not directly involve engineering, but will be influenced by engineering (e.g. planning decisions). Key for engineers considering adaptation strategies is to define the risks and to make choices based on them. A risk-management process facilitates the selection of adaptation strategies by providing a framework for managing them.

CAN/CSA Q850-97 *Risk Management Guideline for Decision-Makers—A National Standard for Canada* is a useful guide that defines the terms and lays out the steps of the risk-management process in Canada. The challenge will be how to deal with the issue of uncertainty in climate change projections for design. Risk assessment will be a key element in dealing with this issue.

CCPE action plan

The Canadian Council of Professional Engineers' (CCPE) Climate Change Impacts and Adaptation Action Plan (CCAP) was developed by the Environment and Sustainability Committee of the Canadian Engineering Qualifications Board. It is based on the results of the Climate Change Impact and Adaptation Workshop—*Adapting to Climate Change—the Role of Canada's Engineers*, February 2003.

Key for engineers considering adaptation strategies is to define the risks and to make choices based on them.

CCPE is also working in partnership with all 12 associations/ordres on climate change adaptation, and with federal, provincial and municipal governments on the CCAP. The action plan was approved by the CCPE board of directors in February 2004.

Strategies include educating engineering students and professional engineers, and raising awareness of the profession, industry, decision makers and the public on the need to consider the impacts of climate change. CCPE will actively seek out experts who can help the profession increase its awareness of climate change and its potential impact.

The plan's goals also include developing standards and codes of practice to incorporate into engineering design, and establishing formal, sustained links between scientists and engineers.

Another particularly important strategy is to put together engineering infrastructure expert working groups to identify and recommend research, development and pilot/demonstration projects. These working groups will assist in reviewing existing national codes, standards, policies and practices, and provide advice to federal government departments.

Engineers must adapt

Climate change is inevitable. Mitigation may slow the rate of climate change, but nothing will reverse current trends. So, as engineers, we have no choice but to incorporate climate change into our practice to adapt and serve the public interest in terms of health, safety and welfare. After all, it is our ethical obligation. Climate change will be a challenge, but it may also offer an opportunity for great engineering innovations.

For more information

- www.climatechange.gc.ca
- www.ec.gc.ca/climate (Environment Canada)
- www.adaptation.nrcan.gc.ca (Natural Resources Canada)
- www.c-ciarn.ca (Climate Change Impacts and Adaptation Research Network)
- www.cics.uvic.ca (University of Victoria Canadian Institute for Climate Studies)
- www.csa.ca (Canadian Standards Association)
- www.infrastructurecanada.gc.ca
- www.ipcc.ch (Intergovernmental Panel on Climate Change)
- www.unfccc.int (Kyoto Protocol)
- www.climatechangecentral.com (Climate Change Central)

DAVID LAPP, P.ENG., IS THE MANAGER, PROFESSIONAL PRACTICE, AT THE CANADIAN COUNCIL OF PROFESSIONAL ENGINEERS.



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APEY 2005 Scholarships Awarded

The Association of Professional Engineers of Yukon is pleased to award two \$2000 scholarships for academic and community service achievement. *These students, and others like them, represent a bright future for the profession and for engineering in Canada.*



Sheng Choi, this years recipient of the John D. Scott Memorial Award, is a graduate of F. H. Collins Secondary School in Whitehorse. Now in his 3rd year electrical engineering at the University of Alberta he enjoys sports including basketball and martial arts training and has acted as the sports representative for the university housing office. Sheng has also volunteered with the *Friends of the University and Stollery Children's Hospital* in Edmonton where, as part of a team of volunteers he interacted with patients, visitors and hospital staff of all ages and backgrounds.



Shawn Sederberg, this years recipient of the J.Y. C. Quong Memorial Award, is in his 3rd year in electrical engineering at the University of Alberta in Edmonton. Shawn is a member of the Alberta Chapter of the Golden Key International Honour Society and through this organization has participated in blood drives as well as fundraising workshops that helped raise money for a women and children's hospital being built in Bangladesh. Shawn is a graduate of Vanier Catholic Secondary School, Whitehorse.

Conferences & Meetings

- **March 29, 2006.** Association of Professional Annual General Meeting, Whitehorse, Yukon.
- **April 8, 2006.** APEY - Innovators in the Schools bridge building competition. Porter Creek Secondary School, Whitehorse.
- **May 9-12, 2006.** Engineering Institute of Canada Conference on Climate Change Technology: Engineering Challenges and Solutions in the 21st Century. Ottawa, Ontario. For information go to www.ccc2006.ca.
- **June 1-3, 2006.** Canadian Council of Professional Engineers/Constituent Members Annual General Meeting, Whitehorse, Yukon. For information contact APEY.

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The ASSOCIATION NEWSLETTER, the official publication of the Association of Professional Engineers of Yukon (APEY) is published three times a year during June-July, October-November and February-March. It reaches approximately 400 registered professional engineers across Canada.

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