

ENGINEERS CANADA

**THE GLOBALIZATION OF ENGINEERING  
EDUCATION AND PRACTICE: IMPACTS ON  
REGULATION IN CANADA**

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SUMMARY REPORT

Ottawa, Ontario  
May 5, 2011



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## EXECUTIVE SUMMARY

The Globalization of Engineering Education and Practice workshop was held on May 5, 2011 in Ottawa, Ontario. The objective of the workshop was to examine and identify the potential impacts of globalization on regulating the profession in Canada with respect to international changes in engineering education, practice and regulation. This report briefly summarizes each presentation and provides an overview of the table group and plenary discussions and recommendations of participants.

### **Theme 1: Understanding the Context of the Globalization of Engineering**

Three presentations were given to build understanding of the issues, challenges and benefits of the globalization of engineering. Dick Fletcher, Chair, International Committee, Engineers Canada, gave a presentation on how Engineers Canada assists in the development of mobility agreements for engineers and its level of involvement in the international engineering community. Then, John Power, Director General, Engineers Ireland, provided an overview of Engineers Ireland, the European Union, regulation of engineers in Europe, education requirements and engineers' mobility in Europe. And last, Jerry Carter, Executive Director, National Council of Examiners for Engineering and Surveying (NCEES) described the NCEES, current issues around licensure and its mobility in the U.S. and key global challenges being faced by NCEES.

### **Theme 2: Federal Government Initiatives on International Mobility**

Under the federal government theme, Michelle Cooper, Director, Services Trade Policy Division, Foreign Affairs and International Trade Canada gave a presentation on Canada's trade agenda and the key principles of its trade negotiations approach. Then, Gerrie Doyle, Canadian Architectural Licensing Authorities (CALA) International Relations Committee Chair outlined some of the international agreements in which CALA is involved (e.g., the Canada/US Inter-recognition Agreement).

Following the presentation, participants worked in table groups to answer three discussion questions. First, participants identified several trade issues that should be a high priority for resolution such as the procurement process and quality-based selection (QBS); support and promotion of international trade agreements and related discussions; the issue of reciprocity; and how to maintain high quality standards in licensing without creating trade barriers.

Secondly, participants suggested some ways to involve the engineering profession in trade negotiations and the establishment of trade positions such as developing networks to maintain relationships and promote knowledge sharing; supporting Engineers Canada as the "national voice" for the profession; involving youth in promoting the engineering profession; and creating a long-term strategy for involving the profession in trade negotiations on a regular basis.

Finally, participants noted that regulated professions could work together by creating a common voice and initiating regular dialogue among professions, students and policy bodies, and by developing a collaboration framework to guide ongoing discussions.

### **Theme 3: Education**

John Hepburn, Vice-President, Research and International, University of British Columbia briefly summarized international engagement activities at UBC and noted some of the ways that globalization of the engineering profession is enhanced through education. Following this presentation, David Strong, Professor and Natural Sciences and Engineering Research Council of Canada (NSERC) Chair in Design Engineering, Queen's University identified current variants in engineering education, and provided

examples of non-traditional programs, offered some global perspectives and challenged participants to consider some challenging questions with respect to the future of engineering education.

Table discussions on the topic of engineering education were held following the presentations. Participants identified a range of concerns about alternative learning approaches for engineering students such as the need to ensure that high quality learning outcomes are met through alternative learning approaches. Specifically, many were concerned about maintaining learning approaches that foster and test students' abilities in areas such as technical fundamentals, problem-solving skills, ethics and social responsibility, team work, professional skills and creativity.

In terms of ways that the Canadian engineering profession and learning institutions can most effectively work with their international counterparts, participants encouraged a holistic approach to connecting with international learning institutions. In addition, they supported the use of approaches such as exchange programs, satellite campuses, internships, distance education and multi-national degrees.

When asked about the degree to which we should work to harmonize our education standards with other countries, several groups urged caution. They did not want Canada to blindly support harmonization to the detriment of its high educational and professional standards. In addition, the cost and complexity of pursuing harmonization could be high. Despite their reservations about harmonization, all participants acknowledged the need to learn about and from the experiences and systems of other countries with the aim of continuous improvement in Canada.

#### **Theme 4: Practice Issues**

John Boyd provided a brief overview of the International Federation of Consulting Engineers and the engineering industry. He also outlined some hurdles that are faced in international engineering, discussed the concept of reciprocity and highlighted some implications for Canadian practice. Andrew Steeves, EXP, focused his presentation on globalization and the procurement of engineering services. Specifically, he argued for the widespread use of a quality-based procurement approach.

Following these presentations, participants identified some key issues regarding the international practice of engineering such as the need to address differences in ethics between Canada and other countries, how to attract and retain professionals and how to promote the benefits of quality-based selection. In response to the second discussion question, participants suggested undertaking actions or activities to help resolve the identified key issues regarding international practice. They emphasized the need for the Canadian engineering profession to speak with one voice to promote the value of engineering and to help small- and medium-sized businesses access good and complex work projects. Collaboration among companies to promote QBS could result in greater understanding and uptake of QBS by clients. They also emphasized the need to participate in open dialogue within the profession and with clients and to raise the overall profile of the engineering profession to government and decision-makers.

#### **Workshop Wrap-Up**

Paul Amyotte closed the workshop on behalf of Dick Fletcher. Key lessons from the workshop include the need to speak with a single, national voice. Engineers Canada could lead this effort but other key members of the engineering community need to be engaged. Overall, there is great value in collaborating with other professions (e.g., architects) and strong, effective relationships enhanced by ongoing dialogue are essential to addressing current and future issues.

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## LIST OF ACRONYMS

ABET	Accreditation Board for Engineering and Technology
ACE	Architect's Council of Europe
APEC	Asia Pacific Economic Cooperation
AUCC	Association of Universities and Colleges of Canada
CALA	Canadian Architectural Licensing Authorities
CEAB	Canadian Engineering Accreditation Board
CELF	Canadian Engineering Leadership Forum
CETA	Canada-EU Trade Agreement
DFAIT	Foreign Affairs and International Trade Canada EMF
EIT	Engineering intern training programs
EMF	Engineers Mobility Forum
EU	European Union
FEANI	European Federation of National Engineering Associations
FIDIC	International Federation of Consulting Engineers
FTAs	Free trade agreements
MRAs	Mutual Recognition Agreements
NAFTA	North American Free Trade Agreement
NCEES	National Council of Examiners for Engineering and Surveying
NSERC	Natural Sciences and Engineering Research Council of Canada
OAA	Ontario Association of Architects
QBS	Quality-based selection
RAIC	Royal Architectural Institute of Canada
TILMA	Trade, Investment and Labour Mobility Agreement
UIA	Union Internationale des Architectes

## INTRODUCTION

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The Globalization of Engineering Education and Practice workshop was held on May 5, 2011 in Ottawa, Ontario. The objective of the workshop was to examine and identify the potential impacts of globalization on regulating the profession in Canada with respect to international changes in engineering education, practice and regulation. The workshop was approved and budgeted by the Board of Engineers Canada.

The session was attended by 61 participants; a list of participants is included in Appendix A. Participants took part in a series of table and plenary discussions addressing four themes: a) understanding the context of the globalization of engineering; b) federal government initiatives to address international mobility; c) education; and d) practice issues. Each theme was framed by a panel of expert presenters who provided an overview of the theme and identified some of the challenges being faced by the engineering profession. Following each panel of presentations, table group discussions were held. They were guided by a number of discussion questions aimed at identifying the globalization issues being faced by engineers including how the regulation of engineering may be affected by globalization, ways to improve the international presence of Canadian engineers and ways that the Canadian engineering profession can change or improve to more effectively work at an international level.

All workshop feedback will be provided to Engineer Canada's International Committee for consideration. After completing their analysis of the materials, the Committee will report its findings or recommendations to the Board of Engineers Canada.

This report briefly summarizes each presentation and provides an overview of the table group and plenary discussions and recommendations of participants.

## WELCOME

Zaki Ghavitian, President, Engineers Canada welcomed participants to the workshop and encouraged delegates to participate fully in the day's discussions.

He noted that education requirements for engineers are changing rapidly and there is an increasing need to work internationally. Further, relevant work experience and continued professional development, including on an international stage, are becoming highly valued proficiencies for licensed engineers. These principles have been strongly embraced by many countries and will soon become a global necessity. Mr. Ghavitian also pointed out some of the pressures on licensing of the Canadian engineering practice such as internal and inter-governmental trade. He emphasized the need to continually analyze available data in order to maintain a clear picture of engineering in Canada and what is needed to regulate it in the future.

## THEME 1: STAGE SETTING

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### MOBILITY OF CANADIAN ENGINEERS

*Presenter: Dick Fletcher, FEC, P.Eng*

*Chair, International Committee, Engineers Canada*

Dick Fletcher outlined key challenges of globalization for engineers and provided an overview of related international agreements. He also addressed the ways in which Engineers Canada assists in the development of mobility agreements for engineers and its level of involvement in the international engineering community.

The challenges of globalization for Canadian engineers include issues such as dealing with different levels of government in Canada as well as different educational systems, quality assurance programs and licensing systems worldwide. Mr. Fletcher noted that the mobility of Canadian engineers is an important political issue and that Canadian engineers, and Canadian engineering degrees, have an excellent reputation worldwide. He

highlighted the value of the Agreement on Internal Trade which creates opportunities for innovation and creativity, and has improved mobility for engineers within Canada.

International agreements are also valuable to the Canadian engineering profession for improving the international mobility of Canadian engineers, raising awareness of engineering education and practices around the world and as a forum for promoting Canadian policies and practices worldwide. The Canadian engineering profession has strong principles which have been built into international agreements without compromise. Mr. Fletcher also emphasized the benefits of building and maintaining relationships with trusted partners in an international context. In the general, the aim is to create workable and valid agreements that hold value for all parties.

Mr. Fletcher reviewed the key elements of existing Mutual Recognition Agreements (MRAs) including educational level agreements such as the Washington Accord and the Accreditation Board for Engineering and Technology (ABET) Agreement, and professional level agreements such as the North American Free Trade Agreement (NAFTA) and bilateral agreements with a range of other countries including Ireland, Hong Kong and France. He also mentioned the need to regularly monitor and continually manage these agreements to ensure they are current, relevant and beneficial.

In closing, Mr. Fletcher noted that Engineers Canada is interested in improving the Canadian engineering profession as well as the engineering profession overall. Therefore the organization believes it has a responsibility to participate on the international stage to help build and maintain international agreements in order to sustain an understanding of what is happening globally and to build quality standards that countries strive to be part of.

## EUROPEAN ENVIRONMENT OVERVIEW

*Presenter: John Power, BE, C.Eng. FIEI*

*Director General, Engineers Ireland*

John Power provided an overview of Engineers Ireland, the European Union, regulation of engineers in Europe, education requirements and engineers' mobility in Europe. He opened his presentation with a short video highlighting the state and global impact of Ireland's economy and business sector. Engineers from Ireland work in both Europe and North America.

Engineers Ireland has 24,000 members, representing all engineering disciplines. The organization registers all engineering professionals in Ireland and holds statutory authority to grant titles. Engineers Ireland also contributes extensively to the international community.

The European Union (EU) consists of 27 member states, each with its own culture, history, economy and regulatory approach; this makes it challenging to create and consistently implement common standards or agreements. The type and extent of regulation systems varies from country to country in Europe (e.g. some countries have strong regulations while others have little or no regulations). Mr. Power suggested that, despite the wide variation in regulatory approaches in the EU, high engineering standards are being maintained, in part due to competitive and market regulation as well as a strong ethics among engineers.

A range of practices also exists regarding the designation of professional status for engineers. In general, Engineers Ireland advocates rigorous standards to qualify for a professional designation (e.g., honours degree, professional experience and a professional interview). Mr. Power also emphasized the need for continuing professional development for engineers. It is critically important to maintain high levels of expertise and skills to meet the demands of changing technology.

Mr. Power highlighted some of the ongoing activities in Europe to enhance the mobility of professional engineers. For example, an *engineerING card* is being implemented in Europe. It is intended to be a central record of an

engineer's stature and credibility (including information about education, etc.). Participation will be voluntary. He also noted the importance of MRAs in enhancing mobility.

In conclusion, Mr. Power noted that engineers make a significant difference to quality of life; there is a role for Engineers Canada in enhancing this. And, whether they are in Canada or Ireland, engineers are operating in a global environment with a variety of different regulatory systems. Mr. Power felt that changes in European legislation have reduced some barriers that are faced by engineers. Nonetheless, he emphasized the importance of effective relationships in making globalization work. And, like Canada, Ireland continues to focus on ensuring high quality standards are used as the basis for these relationships.

## **US - US LICENSURE: CURRENT ISSUES, FUTURE CHALLENGES**

*Presenter: Jerry Carter, Executive Director*

*National Council of Examiners for Engineering and Surveying (NCEES)*

Jerry Carter provided an overview of the National Council of Examiners for Engineering and Surveying (NCEES), current issues around licensure and its mobility in the U.S. and key global challenges being faced by NCEES.

NCEES is a non-profit corporation comprised of members from state and territorial licensing boards that oversee engineers and surveyors. In total, NCEES has 69 member boards.

Professional engineers are designated through a combination of education, experience and examination. Mr. Carter noted that the NCEES recently voted to increase the level of education required for a professional engineering designation to "master's or equivalent." Debate is continuing to determine the meaning of "equivalent."

Mr. Carter noted the importance of mobility in the engineering profession. The NCEES continues to help create mobility of engineers across state lines. NCEES exams are mobile from one state to another thus allowing an individual engineer to take the exam once only to work in different states. The NCEES Records Program also supports the transfer of records (e.g., transcripts, references, exam results) between states to facilitate the receipt of a license in another state.

NCEES is also involved in international activities. It is a signatory to the Asia Pacific Economic Cooperation (APEC) agreement and the Engineers Mobility Forum (EMF). It is not a signatory to the Washington Accord as this falls under the mandate of ABET (which focuses on accreditation). NCEES exams are offered in Alberta as well as a number of international locations (e.g., Seoul, Saudi Arabia). Mr. Carter noted that most state boards consider Canadian Engineering Accreditation Board (CEAB) engineering graduates to have the required depth and breadth of education to be considered for exams and licensing.

In closing, Mr. Carter shared his appreciation of the partnership that exists between NCEES and Engineers Canada.

## **QUESTION AND ANSWER PERIOD**

Following the presentations, participants were provided with an opportunity to pose questions to the presenters.

A participant asked whether Engineers Canada or Engineers Ireland have found other ways to establish international standards regarding education levels (i.e., beyond international agreements)? Mr. Fletcher emphasized the importance of being able to recognize the educational credentials of engineers from countries where educational systems are quite different from the Canadian system. The approach that Engineers Canada has taken is to help improve or develop standards in other countries, where needed (e.g., through international agreements). Mr. Power noted that Ireland supports the continued improvement of standards over time, through their own standards, participation in international agreements (e.g., Washington Accord, European Federation of National Engineering Associations (FEANI)) and relationship building.

What types of recommendations does the NCEES make to state boards when conducting credential evaluations? Mr. Carter responded that NCEES reviews an individual's credentials and provides an advisory statement to a state board for its consideration. The statement includes a detailed description of the individual's credentials, a list of noted deficiencies and an opinion as to whether an individual is qualified for entry into the profession.

A participant noted that master's degrees in Canada are different than those in the U.S. (e.g., in Canada, master's students focus on research rather than course work); thus, further thought should be given as to whether it makes sense to raise education requirements for Canadian professional engineer status as was done by the NCEES in the U.S.

The challenges of evaluating the credentials and experience of foreign trained engineers were also noted. Mr. Carter noted that the NCEES is grappling with this issue as well.

## **THEME 2: FEDERAL GOVERNMENT INITIATIVES ON INTERNATIONAL MOBILITY**

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### **CANADA'S TRADE AGENDA**

*Presenter: Michelle Cooper, Director, Services Trade Policy Division  
Foreign Affairs and International Trade Canada*

Michelle Cooper provided an overview of Canada's trade agenda, the key principles of its trade negotiations approach and highlights of the Canada-EU trade negotiations. Ms. Cooper noted that Canadian engineers are highly respected members of the international community in a wide range of sectors (e.g., construction, oil and gas, etc.). And, while the engineering profession is not a federal jurisdiction, the federal government recognizes the importance of the engineering profession and supports an ongoing relationship with the profession.

The services sector is important to the Canadian economy. It is a key driver in current trade negotiations (e.g., regulatory and mobility barriers in the sector). The Canadian Global Commerce Strategy is being developed to increase market access and to create stability for Canadian engineers who are working abroad.

Ms. Cooper pointed out that Canada is party to Free Trade Agreements (FTAs) with several countries including the European Union, and the U.S. and Mexico (NAFTA). Canada is also in the process of negotiating new FTAs and other agreements such as the World Trade Organization's Doha negotiations (in which Ms. Cooper noted the involvement of the engineering profession).

Several key principles guide Canada's position in cross-border trade in services including: market access (including temporary entry); provisions on mutual recognition; and disciplines on domestic regulations. Improvement of labour mobility is an overarching goal for Canada. It is primarily addressed through FTA chapters related to cross-border trade in services and temporary entry. Temporary entry is typically granted on a project-by-project basis for short periods of time.

MRAs are a means of recognizing the qualifications of service providers to enhance mobility. The department of Foreign Affairs and International Trade Canada (DFAIT) creates a framework and sets some key requirements for MRAs and then turns negotiation over to regulators and other relevant parties to complete the agreement.

Work is ongoing to negotiate the Canada-EU Trade Agreement (CETA). Ms. Cooper indicated that negotiations are proceeding by profession and she touched on the impacts of CETA on Canadian engineers. She encouraged Engineers Canada to continue to communicate with the federal government and the provincial/territorial governments to help inform the trade agenda, to improve understanding of on-the-ground labour and mobility barriers faced by engineers, and to inform government about regulatory changes affecting import and export activities. Lastly, she strongly encouraged the maintenance of relationships between DFAIT and Canadian engineering associations, as well as Canada's engineering and government counterparts in other parts of the world to continue to advance Canadian interests in international trade.

Following her presentation, a participant suggested that procurement is a bigger concern on the international stage for engineers than accreditation; Ms. Cooper encouraged and welcomed further dialogue on this topic.

Ms. Cooper was also asked to describe how DFAIT addresses negotiation challenges that arise from differences in regulatory and other frameworks in different countries (e.g., voluntary code of ethics versus legislated responsibilities). In response, she noted that DFAIT learns from each negotiation and applies lessons learned to new negotiations. She also noted the importance of continued dialogue with organizations such as Engineers Canada to build and maintain a solid understanding of the barriers and challenges being faced on-the-ground.

## **CANADIAN ARCHITECTURAL LICENSING AUTHORITIES - INTERNATIONAL RELATIONS COMMITTEE**

*Presenter: Gerrie Doyle, OAA, MRAIC*

*International Relations Committee Chair, Ontario Association of Architects (OAA) Past President*

The Canadian Architectural Licensing Authorities (CALA) represents 11 Canadian architectural licensing authorities. Ms. Doyle presented eight of CALA's International Relations Committee (IRC) portfolios. These agreements were presented in order of priority to CALA:

- Canada / US Inter-recognition Agreement – This agreement addresses the issue of credential recognition and is currently based on education, experience and examination. CALA is pursuing a relationship that is based more on the mutual recognition and trust of U.S. and Canadian licenses in order to facilitate better mobility of architects (e.g., similar to the reciprocity agreement that exists between jurisdictions in Canada whereby architects licensed in one province are accepted at face value across the country). In addition, to further improve mobility in Canada, CALA is working on a national continuing education program so that architects are required to meet continuing education licensing requirements in one province only.
- Tri-National Agreement – This agreement is in its second year of negotiations between Canada, Mexico and the U.S.
- Architect's Council of Europe (ACE) Accord - This accord was signed in 2005. Barriers and challenges regarding differences in regulatory restrictions on architects make it difficult to develop MRAs.
- Asia Pacific Economic Cooperation - CALA will assume the secretariat in 2014.
- Canberra Accord – This accord facilitates the portability of educational credentials between the signatory countries.
- Union Internationale des Architectes (UIA) – The UIA is an international union of architects. CALA has presented the Royal Architectural Institute of Canada (UIA's member on behalf of Canada) with a draft memorandum of understanding to guide further interaction on this file.
- Quebec / France Bi-lateral Agreement – This is a new agreement between the government of France and the Quebec provincial government.

Ms. Doyle noted that Canada's changing demographics are a key motive for creating and maintaining international agreements that support the international mobility of professions such as architects and engineers. In addition, CALA has noted that a significant portion of young people educated as architects are not entering the profession upon completion of their schooling. This may be due in part to unwillingness by clients to pay professional fees. Ms. Doyle suggested that it is important to have reasonable professional fees with national guidelines (for both architects and engineers).

In her presentation, Ms. Doyle mentioned that provincial/territorial guidance would be useful to help advance the ACE Accord. In response to a question, she clarified that a draft agreement has been developed and distributed to provinces and territories and that assistance in moving it forward to agreement is desired.

## TABLE DISCUSSIONS – INTERNATIONAL TRADE ISSUES

Participants worked in table groups to answer three discussion questions:

1. What are the trade issues that you believe should be the profession's highest priority for resolution?
2. What is the best way to involve the engineering profession so that it may serve as an effective partner in trade negotiations and the establishment of trade positions?
3. How should regulated professions work together to influence international trade negotiations?

Each group shared its responses in plenary and in a workbook that was submitted at the end of the workshop. Responses from the plenary discussion and the workbooks are summarized below.

### *1. What are the trade issues that you believe should be the profession's highest priority for resolution?*

The following trade issues were highlighted as priorities for resolution:

- The procurement and quality-based selection (QBS) process were raised by five tables as a priority issue to address. Two tables encouraged the use of the QBS process as long as professional standards are maintained.
- Support and promote international trade agreements and related discussions in order to remove trade and cultural barriers. One table noted that regulation of the Canadian engineering profession is an integral part of Canadian society, economy and government services and thus requires the creation and maintenance of strong connections between negotiators and provincial and federal regulatory bodies. Another table encouraged consideration of priorities regarding the next countries/markets to approach for agreements.
- Build relationships and education with respect to regulatory requirements.
- Two tables raised the issue of temporary work versus immigration. One table noted that trade issues and immigration are two separate challenges and the solutions may be different for each issue. Another table questioned whether Canada is “stealing” from developing countries by integrating international talent into the Canadian economy. The need to clarify temporary licensing provisions (including addressing cultural differences) was also noted.
- Two tables raised the issue of reciprocity (e.g., if Canada has access to other markets, do we want to allow other countries access to our markets?)
- Understand and address differences in domestic regulation rules (e.g., in bureaucratic procedures; cost of licensure).
- One table was concerned that the outsourcing of engineering services may have the undesirable effect of limiting work opportunities for both Canadian and international engineers working locally (i.e., on-the-ground in another country).
- Ensure that high quality standards are maintained and met; (e.g., do not lower Canadian licensing standards to “lowest common denominator” international standard). Be innovative to ensure that standards are met without causing trade barriers. One table suggested the use of a flexible framework emphasizing high standards of education, experience and specific knowledge of the market.
- Ensure robust accountability for international engineers offering services in other countries
- Internally, focus on creating value for export (this includes services and goods)
- Continue to build bilateral relationships between professions while larger “framework” discussions are taking place, especially in complex jurisdictions

- Address the concern that provincial agreements with groups outside Canada can create a “back door” access to practice in Canada.
- Address the challenges presented by changing demographics in Canada.
- Are we chasing a phantom? Are we at trade capacity already?

**2. *What is the best way to involve the engineering profession so that it may serve as an effective partner in trade negotiations and the establishment of trade positions?***

The best way to involve the engineering profession in trade negotiations and the establishment of trade positions would be to:

- Involve Engineers Canada, provincial engineering associations, provinces/territories, accreditation bodies and educators in a national discussion on this issue. Develop networks to maintain relationships and promote knowledge sharing between the engineering profession and the federal and provincial governments (at political, bureaucratic and regulatory levels). Another table suggested the creation of a unified approach among provincial bodies (e.g., through constituent associations or a national organization). Such approaches could also provide opportunities for the profession to educate officials on how the industry and profession works.
- Support Engineers Canada’s important role in providing a national voice to the profession. Engineers Canada should have a constant presence in discussions as it can provide a permanent and consistent voice for the profession (e.g., knowledge is easily lost as employees change jobs). One table encouraged the appointment of an Engineers Canada representative to assist with ongoing education and communication related to the profession.
- Provide ongoing information (based on practitioners’ experiences) to DFAIT on a regular basis.
- Involve Canadian High Commissions in communications.
- Identify a source of funding for international negotiations.
- Create a long-term strategy regarding the involvement of the profession in trade negotiations and the establishment of trade positions. At the national level, there is a need for an active coordinating role to bring regulators together.
- Establish a national licensing framework with an agreed upon baseline standard.
- Learn from the Trade, Investment and Labour Mobility Agreement (TILMA).
- Provide specific communications to address the risk of “back door” entry into the Canadian market.

**3. *How should regulated professions work together to influence international trade negotiations?***

Regulated professions should work together to influence international trade negotiations by:

- Creating a common voice, and working together on country-specific agreements.
- Initiating regular dialogue among professions, and involving students and policy bodies in the discussion (e.g., Engineering Intern Training programs (EITs)).
- Learning from other regulated professions (e.g., the issues they face; similarities or differences with engineering).
- Providing the engineering professions’ input, with leadership from Engineers Canada, into key elements of agreements (e.g., regulators, profession, business).

- Developing a framework to guide collaboration among professions while respecting the differences between them.
- Establishing a national standard agreement that we will not lower our standards. We must agree to respect three principles: public safety; health; individual competency.
- Using the Canadian Engineering Leadership Forum (CELFF) to address trade issues.
- Providing public support for negotiations and communicating the value of negotiations to the public.

One group was uncertain whether regulated professions should work together. But, they felt that, if they are to work together, professions must connect at a senior management level, with links to regulators, educators, practitioners and other relevant stakeholders (e.g., consulting engineers, public sector, industry).

## THEME 3: EDUCATION

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### INTERNATIONAL ENGAGEMENT AT THE UNIVERSITY OF BRITISH COLUMBIA

*Presenter: John Hepburn, PhD*

*Vice-President, Research and International, University of British Columbia*

John Hepburn launched his presentation with a brief overview of the University of British Columbia (UBC). He noted the importance of international engagement to universities to increase research opportunities, attract students from other countries, and provide a rich learning environment for all students. UBC has an international strategic plan to guide the development of these opportunities. It focuses on three key regions: India, China and Europe. UBC's approach to international education is embedded in its overall approach by encouraging student mobility, providing opportunities for international service learning (e.g., Engineers Without Borders; opportunities to create solutions for engineering challenges in other countries), and building entrepreneurial skills (e.g., by including graduate students in industry research projects).

Dr. Hepburn suggested a number of ways to expand international engagement including 2+2 programs, international internships, and conducting graduate research abroad. He also mentioned the distributed medical education program in BC as a potential model for future international education (students from a number of campuses share common classes (via videoconferencing) and participate in local, hands-on learning to supplement the distance learning portion of their program).

One of the themes at UBC is creating the global engineer. This theme reflects the understanding that engineering is a global profession and students benefit from learning to work in different countries. Dr. Hepburn suggested that universities need to use their curriculum (particularly in engineering and business) to help students learn about working in a global economy by providing students with opportunities such as learning through project-based courses or incorporating international service learning into courses. Overall, education should be provided to train students in non-Canadian issues as well as Canadian issues.

Following his presentation, Dr. Hepburn was asked for his opinion on the creation of satellite university campuses in other countries. Dr. Hepburn noted that UBC did not incorporate a satellite campus as part of its delivery model in order to maintain the integrity of its program; instead, the university is focusing on the creation of partnerships with established universities.

A participant noted that Canadian students do not take part in international learning opportunities as often as other countries send students or research teams to Canada. Dr. Hepburn suggested that language issues may be a primary reason for this (not many Canadian students speak a language other than English or French). He also noted that jurisdictional issues may play a part as it is difficult to promote a "Canadian" approach when there is little coordination among Canadian universities who are seeking international learning opportunities. Currently

each institution sends its own delegation to other countries to promote their institution and research projects without any collaborative efforts among universities to send a *Canadian* delegation.

## ENGINEERING EDUCATION AND GLOBALIZATION

*Presenter: David Strong, P.Eng.*

*Professor and Natural Sciences and Engineering Research Council of Canada (NSERC) Chair in Design Engineering, Queen's University*

David Strong focused his presentation on identifying current variants in engineering education, providing examples of non-traditional programs, offering some global perspectives and challenging participants to think about some questions regarding engineering education and globalization.

Currently, there is a wide range of engineering education pedagogical methods used in bachelor programs ranging from traditional learning to “active” learning to problem-based learning and project-based learning. Mr. Strong highlighted four types of non-traditional learning currently being delivered at the university level:

- Distance learning (offered in very few accredited programs);
- “Integrated” or general engineering whereby the program offers a general engineering education (typically drawn from mechanical, electrical, civil and chemical engineering);
- “Flexible” engineering programs that provide a student with a bigger choice (less core content); and
- “Global” engineering education where globalization is meant to be a bigger focus in the program (e.g., dual degree programs, exchange programs, placements). The University of Strathclyde in Glasgow, Scotland was raised as a potential model: it has an undergraduate Department of Design, Manufacture and Engineering Management which includes a global design course as well as the Global Innovation Management Masters Program.

Mr. Strong continued his presentation with a look at the current realities in engineering and suggested that several “hard questions” need to be asked. For example, where are the needs of the profession heading? What are the risks of harmonized accreditation standards? Where is the line between formal education and engineering training in practice? How much can and should we expect of an undergraduate engineering program?

In closing, Mr. Strong noted that encouraging multidisciplinary and global perspectives will better prepare graduates for the engineering profession. Despite the need to improve, progress is being made and Canada has some good examples of innovative engineering education. Global awareness is increasing – especially among students – and this will help continue the advancement of innovative learning.

Following his presentation, Mr. Strong responded to questions and comments from participants. He was asked to comment on whether CEAB is driving education and if so, whether it is doing a good job. He noted that accreditation drives education to a certain extent. He also suggested that further discussion with engineering practitioners around the world is needed to explore the best approach for improving education.

In response to a question regarding the best way to incorporate global engineering curriculum into a Canadian university, Mr. Strong suggested that one way could be the introduction of a graduate level course that is linked to the University of Strathclyde, and creating more undergraduate course work with a focus on cultural and social diversity.

A participant wondered whether educational outcomes should be determined by the engineering profession or by learning institutions. Mr. Strong felt that they should be set through the joint efforts of the profession and institutions in order to ensure that outcomes address the realities faced by practicing engineers. Professional practice input is important for helping students understand what they need to do to put learning into practice.

## TABLE DISCUSSIONS – ENGINEERING EDUCATION

Participants worked in table groups to answer three discussion questions:

1. What are the concerns the profession may have when considering certain alternative learning approaches for engineering students?
2. In what ways should our Canadian engineering profession and learning institutions most effectively work with their international counterparts (e.g., exchange programs, satellite campuses, multinational degrees, etc.)?
3. To what degree should we work to harmonize our education standards with other countries?

Each group shared its responses in plenary and in a workbook that was submitted at the end of the workshop. Responses from the plenary discussion and the workbooks are summarized below.

### ***1. What are the concerns the profession may have when considering certain alternative learning approaches for engineering students?***

- All participants were concerned about ensuring that high quality learning outcomes are met through alternative learning approaches, and recognized both domestically and internationally. Specifically, many were concerned about maintaining learning approaches that foster and test students' abilities in the areas of technical fundamentals, problem-solving skills, ethics and social responsibility, communications, team work and project work skills, the development of professional skills, and creativity. They were also concerned about maintaining control over the quality of educational programs and learning approaches.
- It was noted that some people (teachers, students, professionals) may not be open to considering unfamiliar methods of learning. Reasons for this were suggested, including:
  - There may be some fear, especially among educators, about losing teaching jobs and/or losing control of the curriculum (e.g., if move to online learning).
  - There may also be a desire to protect or defend current and past teaching methods or approaches.
  - There may be no incentives for educators to develop or implement alternative learning approaches. In the current post-secondary system, professors are typically rewarded more for their ability to attract research funding than for their ability to teach innovatively. This may be a detriment to the creation of alternative learning approaches.
- It takes dedicated time and commitment to implement change, and there is a time lag between implementation and results. Ongoing assessment of innovative approaches could help continue to facilitate change by providing regular feedback in real time (rather than waiting until completion of a project to gather results).
- In addition, participants were concerned about ensuring that alternative learning approaches are appropriately monitored to meet degree requirements.
- Finally, they noted that innovation can be expensive and wondered how it would be funded in the current environment of fiscal restraint.

### ***2. In what ways should our Canadian engineering profession and learning institutions most effectively work with their international counterparts (e.g., exchange programs, satellite campuses, multinational degrees, etc.)?***

- The practice of engineering should be more fully integrated into educational programs.
- The engineering community should be open to change and aware of trends in the global environment including knowledge of best practices worldwide.
- It is important to implement an international, cross cultural element to the education process to provide new graduates with a head start in international practice.

- Take a holistic approach to connecting with international learning institutions such that a broad understanding and knowledge of the university, its program, its values and standards exists to create trust and mitigate risks.
- The engineering profession should support leaders who propose innovative programs.
- Engineers Canada should review the CEAB requirements and process to best incorporate international/globalization elements. A table suggested that protecting the CEAB accreditation process and standards has to be top priority while another encouraged the expansion of current CEAB initiatives for cooperation with and examination of engineering education systems in other countries.
- Institutions should be the innovators; bringing ideas and proposals to CEAB.
- Be open to change and aware of trends and changes in the international context.
- Marketing is required (e.g., outreach to offshore, highly reputable universities); Association of Universities and Colleges of Canada (AUCC) should be involved since it is part of their mandate to market engineering programs abroad.
- New approaches should be subject to continuous monitoring to gauge success, gaps and best practices.
- The following approaches were highlighted:
  - Create linkages between institutions (e.g. for exchanges). CEAB supports innovative approaches to building such linkages.
  - Eight tables explicitly supported the use of exchange programs; one table noted support for exchange programs over satellite campuses. Post-education exchange programs were also suggested by a table (e.g., exchange program with global “customers” and foreign company office).
  - Satellite campuses were specifically supported by three tables. One table felt they could be a good source of future employees for Canadian companies wishing to enter the international market.
  - Internships, distance education, multi-national degrees and incorporating cross-cultural working skills in education were also noted as potentially effective approaches.
  - Design projects that take place in other countries and use methods such as video conferencing or projects based on ‘real world’ problems to deliver learning (e.g., Stratchclyde model).
  - Build on successes that focus on hands-on involvement (e.g. Engineers Without Borders).

### ***3. To what degree should we work to harmonize our education standards with other countries?***

- One table group stated that global reality means harmonization is inevitable. However, several (approximately 7) table groups urged caution around harmonizing education standards. They did not want Canada to blindly support harmonization to the detriment of its high educational and professional standards. In addition, the cost and complexity of pursuing harmonization could be high (especially considering Canada’s jurisdictional issues).
- One group suggested that harmonization is unachievable and should not be pursued; instead, this group suggested creating a range of standardized exams that would accommodate different course structures to illustrate their competency in a particular area of engineering. Another table agreed and suggested a two-pronged approach: a) develop high quality standards within the Canadian context; and b) help international partners understand how their graduates can best prepare for entry into the profession in Canada and help Canadian students and graduates understand the qualifications they will need to go abroad. It was also suggested that harmonization could happen on a systems-wide basis or at a broad standards level, rather than a specific curriculum, or delivery method, basis (e.g., outcomes-based assessment).

- A participant pointed out that, currently, there is no international body that develops or monitors educational standards for the engineering profession; this may make it difficult to focus international discussion on the harmonization of educational standards.
- Despite their reservations about harmonization, all participants acknowledged the need to learn about and from the experiences and systems of other countries with the aim of continuous improvement in Canada. One participant succinctly noted that “a little bit of humility” will help us learn and continue to maintain and improve our high standards.

## THEME 4: PRACTICE ISSUES

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### INTERNATIONAL ENGINEERING: IMPLICATIONS FOR A CANADIAN INDUSTRY

*Presenter: John Boyd, PhD, P.Eng.*

John Boyd provided a brief overview of the International Federation of Consulting Engineers (FIDIC)<sup>1</sup>, and the engineering industry. He also outlined some hurdles that are faced in international engineering, discussed the concept of reciprocity and highlighted some implications for Canadian practice.

Mr. Boyd made four main points in his presentation:

1. As Canadian engineers, our primary responsibility is to protect Canada's quality of infrastructure and through it, our quality of life. He suggested that to do this well, on the international stage, Canadian engineering companies need to build sustainable practices that emphasize the creation of local partnerships and the development of local offices. This helps address the need for trained engineers who can work locally (local engineers are trained and accredited locally); the issue of mobility (by transferring technology, cultural learning, etc. through the local office); and the need for local and innovative approaches.
2. Intellectual colonialism is dead. Mr. Boyd noted that knowledge moves quickly and a sustainable practice allows companies to nimbly take advantage of opportunities.
3. Knowledge about educational comparison is useful for local Canadian firms hiring immigrants. By working locally, with local staff, understanding of the local “rules of business” is gained. Reciprocity is a key ingredient in successful working relationships and agreements. And, governments should challenge the profession to find solutions to engineering problems.
4. A partnership is always a learning experience and “bad” surprises should always result in the immediate suspension of reciprocity.

Following his presentation, Mr. Boyd responded to questions from participants. A participant noted that high quality education is a Canadian strength and the work that has been done regarding accreditation and credential recognition is important. Mr. Boyd agreed that the work of Engineers Canada in this regard has been very useful, especially for small- and medium-sized companies. For larger companies, who are able to create the sustainable business model outlined by Mr. Boyd, local partnerships provide the means by which the company can decipher and understand the meaning of locally obtained education and credentials.

Mr. Boyd was also asked to expand on his statement that government is not challenging the engineering profession. He noted that government is most often fiscally driven when seeking a consultant. He suggested that seeking the cheapest way to do a job does not spark or allow innovation. Governments need to challenge engineers to find solutions to the “big” challenges they are facing (e.g., climate change).

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<sup>1</sup> FIDIC is an association representing 84 countries. It advocates on behalf of industry at the international level (e.g., to the World Bank).

## GLOBALIZATION AND THE PROCUREMENT OF ENGINEERING SERVICES

Presenter: Andrew Steeves, P.Eng.

EXP

In his presentation, Mr. Steeves pointed out that although engineering principles are universal and there are good engineers everywhere, engineering principles cannot be applied in the same manner everywhere. Thus, treating all engineers as equal can lead to the treatment of consulting engineering services as a commodity (sought on the basis of price only). Price-based selection does not value the experience of an engineer or his/her firm and can penalize the firms with the best understanding of a client's needs or those that accurately anticipate complications in the project and/or provide an innovative solution for a project.

Mr. Steeves suggested that quality-based procurement would be a better approach. In this process, the client and firm *first* agree on the desired outcome, develop an understanding of the cost-benefit relationship (i.e., the cost of risk), understand each other's roles and responsibilities and select the right team for the job based on qualifications and *then* based on this foundation, determine the needed resources for the project. Price is important but is not the sole determinant for selection. Mr. Steeves encouraged participants to carefully consider Quality Based Selection (QBS) as a best practice for engineers.

Following his presentation, Mr. Steeves fielded questions from participants.

A participant pointed out that the quality of a project is an important criterion when potential clients are reviewing consultant proposals (i.e., evaluation criteria based 80% on quality and 20% on price). However, Mr. Steeves pointed out that, if several applicants meet the quality criteria, the selection process would be based solely on price from that point on.

Some participants agreed with Mr. Steeves that engineers need to recognize the value of their own work. Many also agreed that placing a strong focus on quality over price can lead to a better product and long-term savings through consideration of life-cycle costs. It is important to include life-cycle costs into the cost of a project.

When asked about international procurement, Mr. Steeves indicated that when price is the first consideration, it can result in the hiring of international professionals who may not have appropriate experience at the local level (e.g., no knowledge of engineering in a northern climate).

One participant commended the presenter for continuing to promote QBS and asked about the progress that has been made in government. Mr. Steeves responded that progress has been made -- the province of Quebec is going to adopt QBS and a federal government department is going to run a pilot. He also noted that FIDIC is also developing a QBS document.

Another participant shared the following advice for the engineering profession:

- Showcase best practices - Pick like minded partners to undertake "big and bold" QBS projects that display Canadian engineering expertise and then showcase the completed projects.
- Engage all relevant and interested parties as much as possible in the preferred process.
- Engage the right people (e.g., Treasury Board, Public Works and DFAIT) and clearly put your views forward.

### TABLE DISCUSSIONS – PRACTICE ISSUES

Participants worked in table groups to answer two discussion questions:

1. What are the industry's key issues regarding the international practice of engineering?
2. How should our profession work to help resolve these issues?

Each group shared its responses in plenary and in a workbook that was submitted at the end of the workshop. Responses from the plenary discussion and the workbooks are summarized below.

## **1. *What are the industry's key issues regarding the international practice of engineering?***

Participants identified the following key issues regarding the international practice of engineering (in no particular order of importance):

- How do we best understand, respect and meet local engineering standards and codes of practice, and business practices?
- How can we address, at all levels, differences in ethics between practice in Canada and practices in other countries? And, to what extent do we bring Canada's best knowledge or practices to international work? Should we apply Canadian standards locally? Is this ethical or professional?
- How do we make money on international contracts? Attracting and retaining people in our profession / engineering service industry requires improved financial returns. Further, how do we avoid the 'race to the bottom'; that is, competition among Canadian firms "just for sake of competing" and turning engineering services into a commodity?
- How can we promote the benefits of QBS to our counterparts and colleagues? How can we effectively integrate the QBS concept into our business so that we can be innovative, provide clients with the best value for cost on a life cycle basis, manage risk, and easily identify the value-added portion of projects? How can we embed QBS and life cycle analysis into trade negotiations and the education system?
- How can we, as a profession, be more open to innovation? How can we increase appreciation that there is a wide variance in 'correct' engineering solutions?
- How can we further address jurisdictional issues in Canada that are limiting our international mobility?
- How can we promote the importance of partnering with credible local experts?
- How can we develop competencies in Canadian engineers so they can easily undertake international work?
- How can we more effectively and accurately assess an international engineer's experience?
- How can we control the chain of custody and responsibility for engineering work done in other countries for Canadian projects being undertaken by locally trained (i.e., not Canadian) engineers?
- How can we continue to develop relationships (with government, local partners, other countries' engineering associations, etc.)? Relationships are vital to moving forward into a successful future; they lead to trust and a deeper understanding of local needs and realities.

## **2. *How should our profession work to help resolve these issues?***

Participants suggested undertaking the following actions or activities to help resolve the issues identified above:

- Value ourselves and our services. Speak with one voice to promote the value of engineering (e.g., through Engineers Canada) and to help small- and medium-sized businesses access good and complex work projects. Collaboration among companies to promote QBS could result in greater understanding and uptake of QBS by clients.
- Continue to promote, enhance and participate in open dialogue within the engineering profession (e.g., at venues such as this workshop) and with clients, especially about key issues such as QBS.
- Provide leadership by taking a proactive approach. For example, identify issues (e.g., climate change) where engineering solutions can make a difference, then share our views and suggested solutions to promote our profession and increase our competitiveness.

- Raise the profile of the engineering profession to government and decision-makers. Provide clear (and forceful) advice to decision-makers (including those who negotiate international agreements) regarding the desired future direction of the engineering profession.
- Provide guidance to educators regarding the desired future direction of the engineering profession so that appropriate tools, programs and courses can be developed at educational institutions to support the vision.
- Proactively educate clients, politicians, supply officers, professional engineers and educators on the full cost analysis / life cycle approach.
- Develop rules or standards for the profession regarding the need for a life cycle approach to project proposals (e.g., additional spending at the design phase can create savings in operations and maintenance). Ensure that these standards benefit everyone and promote the principles of QBS.
- The Engineers Canada Government Relations Committee could play a larger role.
- Take action even before the “exact solution” has been found

## WORKSHOP WRAP-UP

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Paul Amyotte closed the workshop on behalf of Dick Fletcher. He thanked the presenters for their stimulating and thoughtful presentations. He also thanked participants for the high level of interest and effort throughout the workshop. Finally, he thanked those responsible for organizing the workshop including Lynn Tremblay, Chantal Guay, Ken McMartin and their teams.

Mr. Amyotte shared Mr. Fletcher’s key lessons from the day:

- There is a need to speak with a single, national voice. Engineers Canada could lead this effort but other key members of the engineering community need to be engaged.
- Key barriers to international work need to be targeted and removed while maintaining Canadian standards. Canada should not be complacent about its own excellence; there are many good engineers throughout the world.
- There is great value to be found in collaborating with other professions (e.g., architects).
- The importance of strong, effective relationships cannot be overstated. An ongoing dialogue and continued open communication will help address current and future issues.

All workshop feedback will be provided to Engineer Canada’s International Committee for consideration. After completing their analysis of the materials, the Committee will report its findings or recommendations to the Board of Engineers Canada. Decisions of the Board will be communicated to all participants

At the end of the workshop, participants were asked to submit a feedback form with their evaluation of the day’s proceedings. This feedback is summarized in Appendix C.

All workshop presentations and this summary report will be available online to all participants as soon as possible.

## APPENDIX A – LIST OF PARTICIPANTS

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**Table 1**

- David Adams
- Pat Quinn
- Frank Denton
- Mark Tokarik
- Gerrie Doyle
- Gordon Griffith

**Table 4**

- Ishwar Bathia
- David Euler
- Darryl Ford
- Jean-Bernard Ratté
- Nathan Lysons

**Table 7**

- Bob Dony
- Johnny Zuccon
- Len White
- Darrel Danyluk
- John Power
- Ken McMartin

**Table 10**

- Catherine Karakatsanis
- Michael Mastromatteo
- Tina Maki
- Claude Laguë
- John Boyd
- Alana Lavoie

**Table 2**

- Kim Allen
- Kathryn Sutherland
- Kris Dove
- Charles Boisvert
- John Hepburn
- Chantal Guay

**Table 5**

- Thomas Chong
- Michael Price
- Gillian Pichler
- George Roter
- Zaki Ghavitian

**Table 8**

- Diane Freeman
- Digvir Jayas
- Louis Tremblay
- John Plant
- Michele Cooper

**Table 11**

- James Lee
- Howard Brown
- Louise Quesnel
- Michael Ball
- Stephanie Price

**Table 3**

- Paul Ballantyne
- Robert Wilson
- Lloyd Henderson
- Chris Zinck
- David Strong
- Jerry Carter

**Table 6**

- Denis Dixon
- Paul Amyotte
- Jim Smith
- Andy Robinson
- Maria Pantazi-Peck

**Table 9**

- Santosh Gupta
- Dick Fletcher
- Paul Blanchard
- Jacinta O'Brien
- Andrew Steeves
- Will Meyer

**Facilitation Team, Intersol Group**

- Frank Van Gool  
Facilitator
- Kerriane Carrasco  
Report Writer

## APPENDIX B – WORKSHOP PROGRAM

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# AGENDA



Thursday, May 5, 2011, Ottawa Convention Centre, Meeting Room 212

**7:30 - 8:45**

Breakfast

**8:45 - 8:50**

Welcome and Introduction

**8:50 - 10:10**

**Session 1:** Stage Setting.....60 min

Topics: This session will paint the picture of what is the current practice for engineering education, practice and regulation in Canada, what is occurring in the world, including changes in the European educational system and mobility within the European Union and what is occurring in the United States.

Question and Answers.....20 min

**10:10 - 10:30**

Health Break

**10:30 - 12:00**

**Session 2:** Federal Government Initiatives on International Mobility.....45 min

Topics: This Session will outline current Free Trade agreements that under negotiations, the future trends and policies in future trade negotiations and how free trade agreements may impact the regulation of engineering in Canada from the perspective of other regulators.

Table Discussion.....30 min

Plenary.....15 min

**12:00 - 1:00**

Lunch

**1:00 - 2:30**

**Session 3:** Education.....45 min

Topics: The future in education discussions will cover such issues as satellite campuses, multinational degrees, and the future of education delivery cover such issues as distance learning, correspondence courses which will affect engineering education.

Table Discussion.....30 min

Plenary.....15 min

**2:30 - 3:00**

Coffee

**3:00 - 4:30**

**Session 4:** Practice Issues.....45 min

Topics: Issues covered will include the needs and global challenges of industry, consulting, the use of outsourcing, international procurement issues, the effect of international agreements on consulting, mobility within multi-national companies (inter-office transfers) and the use foreign offices for design work in Canada.

Table Discussion.....30 min

Plenary.....15 min

**4:30 - 5:00**

Wrap-up



## The Globalization of Engineering Education and Practice:

Impacts on Regulation in Canada

Thursday, May 5, 2011,  
Ottawa Convention Centre, Meeting Room 212



**This workshop will focus on the potential impacts of globalization on regulating the engineering profession in Canada with respect to international changes in engineering education, practice and regulation.**

Engineers Canada's involvement in various international activities has facilitated the collection of information on this subject that needs to be analyzed and consolidated into a clear picture of trends. More importantly, we must determine what information is required for our constituent associations and their members. Through today's workshop, we will work together to complete the information gathering and then synthesize the knowledge on this subject so next steps can be identified.

**Welcome and Introduction:**

Zaki Ghaivitan, P.Eng.,  
President, Engineers Canada

**Facilitator:**

Frank Van Gool,  
Senior Consultant and Facilitator  
Interool Group

**Session 1: Stage Setting:**

Dick Fletcher, FEC, P.Eng.  
Chair, International Committee  
Engineers Canada

John Power, BE, C.Eng., FIEI  
Director General, Engineers Ireland

Jerry Carter, Executive Director,  
National Council of Examiners for  
Engineering and Surveying (NCEES)

**Session 2: Federal Government Initiatives**

on International Mobility:  
Michelle Cooper, Director  
Services Trade Policy Division  
Foreign Affairs and International Trade Canada  
Gerrie Doyle, OAA, MRAIC  
International Relations Committee  
Canadian Architectural Licensing Authorities (CALA)

**Session 3: Education:**

Dr. J. Hepburn,  
VP Research & International  
The University of British Columbia

Dr. David Strong, P.Eng.  
Professor and NSERC Chair in Design Engineering  
Queens University

**Session 4: Practice Issues:**

Dr. John Boyd, P.Eng.  
Immediate Past President  
International Federation of Consulting Engineers (IFCIC)  
Andrew Steeves, P.Eng.  
Senior Advisor  
EXP (Formerly ADI Limited and Trow Global)



**Dick Fletcher, FEC, P.Eng.**

Dick Fletcher earned his BSc in civil engineering from the University of Saskatchewan in 1968. After working for the city of Whitehorse as its first city engineer, he launched a long career as a consulting civil engineer, spending 11 years with EPEC Consulting Western before joining Urban Systems in 1984. Dick is a partner in the Kelowna office of consulting firm Urban Systems, and is a great believer in the need for individual members to promote the P.Eng./P.Geo. designations and the professions' visibility. Since becoming nationally involved in the profession with Engineers Canada in 1993, he has chaired both the Canadian Engineering Qualifications Board and the Canadian Engineering International Board, was the organization's president for the 2008-2009 term, and is currently a member of Engineers Canada's International Committee.



**John Power, BE, C.Eng., FIEI**

John Power is director general of Engineers Ireland. Prior to this position, he was head of corporate affairs at ESB – the state-owned Electricity Supply Board. John has held several key positions during his time with ESB: managing director of ESB International Consultants, executive director of ESB International Services and Industrial Holdings, as well as senior roles in human resources and corporate change. Before joining ESB, he was a technical advisor with General Electric in the United States and in South America. John is a graduate in electrical engineering from the University College Dublin and holds a master's in industrial engineering and an MBA. A native of Tralee, Co Kerry, he was also secretary of the Irish Committee of the World Energy Council from 2000 to 2003.



**Jerry Carter**

Jerry Carter is the executive director of the National Council of Examiners for Engineering and Surveying (NCEES). He serves as secretary of the NCEES Corporation, subject to the Board of Directors and Council policies. He also serves as the Council's chief employed officer, with full authority for the management of Council affairs. Prior to this position, Carter served as associate executive director at the Council. Prior to joining NCEES, Carter was the executive director of the North Carolina Board of Examiners for Engineers and Surveyors in Raleigh, N.C. As a former Board administrator, Carter brings a wealth of knowledge on the licensure system. Carter is also a key figure in maintaining relations between NCEES and licensing bodies in other countries and in encouraging international dialogue.



**Michelle Cooper**

Michelle Cooper is currently director of services trade policy at Foreign Affairs and International Trade Canada. She returned in 2010 from Geneva where she represented Canada at the Permanent Mission of Canada to the World Trade Organization, primarily for the negotiating groups on environment and trade facilitation as well as covering TBT issues. Prior to this, she was deputy director for Multilateral Trade Policy in Ottawa. She spent three years on posting in Santiago, Chile working on bilateral trade and economic relations with Chile. She has also held positions relating to Asia-Pacific Economic Cooperation and market access and agricultural trade. Michelle holds degrees from McGill University and the University of British Columbia.



**Gerrie Doyle, OAA, MRAIC**

With over 30 years of industry experience as a project manager and architect, Gerrie Doyle has specialized in challenging, large-scale multi-disciplinary projects – delivering cost effective and timely solutions to complex problems. Between 2000 and 2009 she was the project manager for both expansion phases of the Macdonald-Carter International Airport located in Ottawa. Planning, management and issue resolution at both macro and micro levels are Gerrie's strong suits, contributing to a project a high level of professional and technical expertise that is both relevant and current. A proactive and high-energy project manager that is comfortable in all working environments – from corporate boardrooms to construction sites. Gerrie brings a keen sense of judgement, professionalism and technical expertise to her work.



**Dr. John Hepburn**

Internationally renowned for his research in laser spectroscopy and laser chemistry, Dr. Hepburn has delivered 200 lectures at international conferences and research institutions in North and South America, Europe, and Asia. He graduated from the University of Waterloo with his BSc in 1976, obtained his PhD from the University of Toronto in 1980, and after two years as a NATO postdoctoral fellow at the Lawrence Berkeley National Laboratory he was appointed an assistant professor of chemistry and physics at the University of Waterloo in 1982 – and ultimately chair of chemistry in 1998. In 2001, he moved to the University of British Columbia as a professor of chemistry and physics & astronomy, and head of chemistry. He became dean of science in 2003, vice-president research in 2005, and added the international portfolio to his list of responsibilities in 2009.



**Dr. David Strong, P.Eng.**

A Queen's graduate in mechanical engineering, David Strong spent over two decades in the private sector in engineering and management before joining Queen's as the NSERC chair in design engineering in 2003. In his faculty-wide appointment, David's goal is to enhance student's engineering design and professional skills by working collaboratively on educational initiatives with all engineering departments. One of his key initiatives was the introduction of an elective "Multidisciplinary Design Stream", in which students participate in a series of courses and industry sponsored projects that build significant and relevant skills to foster creativity and innovation in their future careers. Since joining Queen's, David has received multiple awards for teaching and student support, including the 2010 Queen's Alumni Award for Excellence in Teaching.



**Dr. John Boyd, PhD, P.Eng.**

Dr. Boyd was in the consulting engineering business for more than 35 years with Golder Associates, occupying such positions as president of the Canadian operating company and vice-president operations of the Golder Group. His other numerous appointments include chairman of the Association of Consulting Engineering Companies-Canada, director and subsequently president of Peel Red Cross, a member of the Faculty Advisory Board of McGill University, and a member of the Executive Committee of FIDIC, of which he is currently past-president. Dr. Boyd is the recipient of the President's Award of the Irish Consulting Engineering Association for his contributions towards sustainability in engineering and of the Chairman's Award of the Association of Consulting Engineering Companies-Canada for exceptional contributions to the Canadian consulting industry.



**Andrew Steeves, P.Eng.**

Andrew Steeves has been part of the ADI Group of Companies (now known as EXP) for over 30 years, attaining the role of vice-president administration and secretary-treasurer. In 2009, he accepted responsibility for special projects. A graduate of the University of New Brunswick with degrees in engineering and business, the 2010 ACEC Beaubien Award winner is past-chair of the Association of Consulting Engineering Companies-Canada and a winner of its Chairman's Award for his efforts on promoting Qualifications-Based Selection. Past-president of the Association of Consulting Engineering Companies-New Brunswick, he has been involved with FIDIC – serving as co-chair of the 2008 FIDIC Summit and as a member of the Qualifications-Based Selection Task Force – and has served on various Engineers Canada and Canadian Society for Civil Engineering committees.



## APPENDIX C – SUMMARY OF WORKSHOP FEEDBACK

<b>Workshop Evaluation Form (39/60)</b>	<b>Strongly agree</b>	<b>Agree</b>	<b>Disagree</b>	<b>Strongly</b>	<b>No opinion</b>	<b>Does not apply</b>
<b>WORKSHOP</b>						
1. The anticipated length of the workshop was realistic based on the planned agenda	12	<b>25</b>				
2. Going into the workshop, I understood what was expected of me as a participant, and what was expected of the other participants	4	<b>26</b>	8	1	1	
3. The agenda was followed and the time allocated to each item	12	<b>22</b>	3		1	
4. All participants were able to take part and contribute meaningfully to the discussions	15	<b>21</b>	1			
5. All participants listened carefully to each other	15	<b>22</b>			2	
6. Deliberations were conducted in a thoughtful and objective manner	14	<b>22</b>		1	2	
7. All aspects of issues were explored	2	<b>19</b>	13		2	1
8. Conflicts were openly explored and constructively managed	3	<b>19</b>	3		1	9
9. My participation contributed to the outcomes achieved	6	<b>21</b>	3		5	1
10. Do you believe there is value in holding another such workshop in the future?*	<b>20</b>	10	3		3	
11. Overall, I am satisfied with the workshop and feel that my time was well spent	<b>19</b>	17	1		1	

Comment under question 10:

- More work need on this topic
- No-work with the information received today first
- A workshop – yes, rather than a series of presentations

## What was your most valuable learning or insight from this workshop?

- Engineering profession is evolving – mostly for the better and issues are addressed professionally albeit at glacial speed
- All of the activities that are going on in education, professional organizations and industry and the insight from those who are in the game
- Willingness to incorporate global exposure into undergraduate engineering program. Commitment to maintain high standards
- Information on US licensing. Review of Engineers Ireland and challenge in common EU accreditation for negotiating FTAs
- Energy and interest to focus on the future engineering issues. Development/management is required and not well coordinated (yet)
- Knowing about the challenges of the engineering industry and profession
- Better model of selling engineering services internationally – Canadian only – multi-national forms. Perils of price based procurement of engineering services to the future of engineering in Canada
- The open dialogue between the various stakeholders in the engineering profession was very enlightening
- Still issues with the CEAB strongly influencing engineering education
- The difficulty in educational standards and experience standard
- The general feeling over an issue that we need to solve as soon as we can
- Much better feel far how you in Canada work from the engineering profession. You appear a lot more in common across the provinces then differences – well worth building upon
- Was all good
- Accreditation drives engineering education. I was particularly interested in the education discussions
- Hearing view points and experiences from other participants
- Meeting some of the participants and discussing the erroneous concept that a Masters should be required
- Engineers Canada plus others (ACEC-Canada) must increase our involvement in free trade negotiation especially procurement
- “Qualifications are not universal”
- The world is a big place
- Stage setting session
- American accreditation/licensing system. Practice issues (QBS)
- Hearing from some engineering deans about CEAB realities
- Perspectives from non-educational participants
- Gained valuable learning from all speakers and participants. Enjoyed and had good conversation with John Power
- To be open to global engineers
- Very good discussion of issue, very educational for me
- The expectations of trade negotiations
- Some important actors were absents Qualifications Board, Accreditation Board and Deans
- That the organizers had entire session on engineering, education and did not bother to consult nor invite members of the accreditation board, except the chair. The knowledge about international educational program and systems that many AB members have could have added maternally to the understanding of this important topic.



## How would you rate the overall value of this event (relevance) on a scale of 1 to 5?

Note: low value – 1, high value – 5

- 5 = 16/39      4 = 17/39    3 = 2/39    2 = 2/39    no rating = 2/39
- The presence of DFAIT worth the effort alone, the input of speakers was insightful :) not insightful
- This is very important issue for the future of engineering in Canada
- There was not enough Q&A time. These should have been 1 less session and expand time for discussion. Thank you for putting on the session.
- Not much I did not already know and I am not sure how much further this 'workshop' moved the issue of "globalization" along Engineers Canada agenda.

## In your opinion, what was MOST relevant or valuable about the workshop?

- Presenting to DFAIT a picture of the value of engineering
- The presentation by various people from different perspective. Inclusion of people from DFAIT
- Range of presentations – structure covered most relevant topics
- Good meeting ground for different sources of opinion
- Interactions and diversity of participants
- Good overview of international engineering profession
- Divergence of opinion
- Internationalization of the profession
- The engineering profession worldwide has significant challenges but solution can be found
- Session 1 – info in stage setting (perspective from other jurisdictions) – Session 2 – Federal Government initiatives – Session 3 – was also very good – Session 4 – All very good
- The opening presentations nicely set the scene, all of the topics and talks were very informative
- Net working opportunities sharing experiences with others
- Consensus of maintaining our standards. Some great info from architects
- Open conversations through breaks, lunch, sidebar conversations, etc.
- Bringing people together
- John Power presentation on Ireland and Europe
- UBC Globalization and David Strong presentations. Jerry Carter was good too!
- Private sector perspective
- Question/answer – plenary sessions – table discussions
- Government initiatives on international mobility
- Understanding of agreements and expectations
- Connecting with others, who have different backgrounds and perspective, and sharing ideas. Too little time was allotted for this.



## In your opinion, what was LEAST relevant or valuable about the workshop?

- The limitation on discussion especially in the AM
- Not enough exploration of the MRA issue
- Andrew Steeves was disappointing. Sacked relevance to day to agenda
- Depth of education study
- Program accreditation because it's a whole other issue
- I liked it all
- Keep of the good work. I look forward to the collected outcomes
- A emphasis on accreditation vis-à-vis procurement issues
- Education standardized exams
- Pitch for Ireland tourism
- Government perspectives
- Presentation by architect's association
- QBS
- This workshop had be to be driven by Qualifications Board, Accreditation Board
- The fact that this was not really a workshop. It was a series of presentations within little time to discuss the issues. This was, at best a seminar series. If anything like this is considered for future, it should be re-balanced to allow much more time for dialogue among participants – this is where Engineers Canada will achieve the greatest input this comment is in no way meant to diminish the presentations made today.

## Other suggestions or comments:

- The Canadian Engineering Leadership Forum has a lead role to play as it represents the spectrum of engineering in Canada
- Very good selection of speakers who were all well prepared
- The direction of future of profession requires key stakeholders interaction – institute disciplines societies, regulators, practitioners. What happened to Leadership Forum – what is a next step?
- Well structured and good range of speakers
- Depth of Federal Government initiatives could be deepened
- J. Power - I was honoured and thrilled to be involved.
- Please make all presentation available electronically. It would be really useful to have them as resources from this workshop
- Need young people participation
- Trust is overrated. Protecting the public is paramount and should not be overridden by personal relationships
- More background on Engineers Canada's internationalism (harmonization) efforts – and rationale for same – would be useful
- Invite larger student representation at future meetings
- Well done International Committee
- Merci Lynn!
- This event was missing a clear set of objectives and expected outcomes. As well there was no explanation about what was expected of participants prior to the event. If a future event is planned, it is essential to articulate the objectives-goals, and expected outcomes clearly. And these should be tied into the strategic plan of Engineers Canada, so there is an understanding about how the results fit into Engineers Canada mandate and goals.