
12.0

Canadian Employers' Experience with International Engineering Graduates

The purpose of this section is to provide an overview of the experience of Canadian employers with international engineering graduates. The study is based on 21 interviews with engineering managers or human resources managers in companies that employ a minimum of five engineers. The results of the interviews reflect the individual experience of these engineering managers or human resources managers with international engineering graduates over the past three to five years.

LEVEL OF EMPLOYMENT

Employers reported mixed experience with the level of employment of international engineering graduates. Approximately half of the employers interviewed reported that international engineering graduates worked at the same level as Canadian-trained engineers. The remainder reported either that international engineering graduates usually worked at a lower level, i.e. engineering technologist, or that the company's experience was mixed.

Employers pointed to three factors as important in determining the level of employment of an international engineering graduate. First, and by far the most important, is the individual's ability to communicate in English (or, in Quebec, in French). Second, is the individual's prior employment experience in Canada. Individuals with no, or comparatively little, prior Canadian engineering employment are more likely to be hired into technologist level positions than engineering positions. Third, employers in some industries attach particular importance to professional licensure and will not recruit or promote individuals into

"International engineering graduates work at the same level as Canadian trained professional engineers. This is true for all the international engineering graduates including those from [Eastern Europe, China and South Asia]."
Major Utility

"If it is an international engineering graduate's first job – the company is more cautious. If the international engineering graduate has years of experience, he or she would work at the same level as Canadian trained engineers."
Consulting Firm

engineering positions unless they are registered by the relevant engineering association/ordre.

Our interviews suggested that the jobs for which international engineering graduates are hired are usually above entry-level positions, unless the individuals have no prior experience whatsoever. In other words, *virtually all of the employers whom we interviewed took some account of the experience and age of their international engineering graduates when determining positions for which those individuals would be suitable.* This may have implications for the internship programmes or experience requirements of the regulatory bodies. Many of the employers interviewed do not see international engineering graduates as requiring the same degree of supervision or mentoring as would be the case for a recent graduate who is employed as an engineer-in-training.

Of the 21 employers interviewed, two made reference to explicit company policies that require professional registration for all engineering positions. If an international engineering graduate does not hold a P. Eng. designation, then he or she either would not be hired or would only be hired into a technologist-level position. (It should be noted that, while only three interviewees referred to policies requiring a P. Eng. designation, from other sources we are aware that a greater number of these companies have such policies or, at least, give strong preference to persons who are registered.)

"They work more at the technologist level. However, this depends on the individual's capabilities – there is no reason why they cannot work at the same level as Canadian trained professional engineers."
Major Manufacturer

Many companies are reluctant to discuss licensing issues when the study is being conducted by a body such as the CCPE which is comprised of organizations with licensing powers. Nevertheless, our interviews point to a possible tension between assessing an international engineering graduate's suitability for an engineering position based solely on his or her skills and experience and assessing suitability based on professional registration. *Approximately half of the companies interviewed for this study appear to assess suitability solely, or almost solely, on the basis of skills and experience. This may have led these companies to de-emphasize professional licensure as a qualification.*

TECHNICAL KNOWLEDGE AND PRACTICAL EXPERIENCE

Virtually all employers reported that international engineering graduates whom they employed had a technical knowledge of engineering that was equivalent to that of Canadian-trained engineers. Indeed, the experience of most employers was that international engineering graduates training was sufficiently strong that there was little or no need, on the company's part, to test for technical knowledge. It should be noted that these comments were typically made in the context of engineers whose university training was not completed in jurisdictions that are party to the Washington Accord on mutual recognition of educational qualifications. Moreover, the comments regarding technical equivalency were made in terms of each company's engineering requirements. If, as is likely, Canadian engineering training

"The company does not test international engineering graduates on engineering theory... International engineering graduates are very well trained technically."
Major Manufacturer

exceeds the technical requirements of many Canadian employers, it should not be surprising to discover that many Canadian employers judge foreign engineering training to be equivalent, even when a rigorous and objective comparison of curriculum leads to a different conclusion. Among the employers interviewed, only one expressed

"International engineering graduates' knowledge of engineering theory is not as good for those engineers without a mastery of English. However, knowledge of engineering theory is hard to evaluate, because the engineer may know the material and just have trouble communicating it."
Major Manufacturer

a reservation about the technical qualifications of international engineering graduates. That employer, however, qualified its reservation by noting that weakness in English communication may mask technical competence.

If the technical training for international engineering graduates was generally deemed commensurate to that of Canadian-trained engineers, the same cannot be said of the applied engineering experience of those international engineering graduates who obtained their qualifications outside of the US or the UK.⁴²

"International engineering graduates are a little less practical – they are more theoretical."
Consulting Firm

Approximately two-thirds of the employers interviewed assessed the practical experience of international engineering graduates in solving engineering problems as weaker than that of Canadian-trained engineers. For some employers, this difference was moderate or marginal.

For others, the gap was much more significant. In particular, one employer noted that international engineering graduates were much more likely to have difficulty with engineering problems that required creativity or innovation. Another noted that international engineering graduates need to be re-taught technical specifications.

"This [i.e., applied engineering] is where international engineering graduates require a little more direction from others."
Major Manufacturer

Three factors were suggested as explanations for the difference in the quality of practical experience. In some countries, formal qualification as an engineer may not require significant practical experience. In other cases, employment conditions may have been so poor that technically qualified engineering graduates were unable to find engineering employment at an appropriate level. Finally, some international engineering graduates immigrate to Canada shortly after completing their university training.

NON-TECHNICAL SKILLS

Canadian employers were unanimous in identifying language skills as the most important skill weakness of international engineering graduates. This observation, of course, did not apply to engineers trained in English-speaking jurisdictions. As well, many engineers who were trained in Western Europe acquired proficient English (or French) in the course of elementary and secondary school education. Engineers from south Asia were also often exempted from this observation, if they had been educated in English-medium schools.

Language skills deficiencies affect the overall employability of international engineering graduates in three ways. In the first place, companies that require their engineers to deal with customers are reluctant to employ international engineering graduates in these positions, if their language skills are not up to the required standard of proficiency. Second, many companies — especially in the manufacturing sector — have adopted a team-based organizational model in which engineers must work with, and communicate with, other engineers, as well as non-engineers. Poor language skills seriously affect the ability of an international engineering graduate to work effectively in a team-based organizational unit. Finally, some engineering jobs require engineers to explain technical issues to non-technical staff. Indeed, in some companies, an engineer may report to a non-engineer. In these circumstances, poor language skills can be a significant impediment.

"[Communication] is where the international engineering graduates really fall down. Communication is very difficult for them. This is primarily for the Asian trained engineers. Language and culture are the problem. [However], the engineers from the U.S. and Western Europe are comparable to Canadians."
Consulting Firm

42 The failure of interviewees to mention other jurisdictions, such as Australia, New Zealand, or Germany does not imply that engineers who qualified in those jurisdictions are lacking in practical experience. Rather the principal examples of equivalency that arose in most interviews were the US and the UK.

WORKING IN TEAMS

As noted, a large number of Canadian employers use an engineering team as their basic organizational unit. These engineering teams usually include technicians or technologists

"It was much more difficult for the foreign-trained engineer to work in a team. He preferred to work alone, not in a team setting. His social ability was not the same as the other engineers."

Major Manufacturer

"The international engineering graduates operate 80% as well Canadian trained professional engineers in their ability to work with other members of the engineering team. Their abilities are somewhat reduced due to verbal and writing deficiencies."

Major Utility

and, in some cases, individuals with qualifications in science disciplines other than engineering. The ability of engineers to work in engineering teams is therefore critically important to many Canadian employers. Other studies have pointed out that team-based methods of organizing work put a premium on communications skills and co-operative problem-solving. Many employers rate these "soft skills" as highly as technical skills. The employers interviewed for this study were divided on the affinity of international engineering graduates for work in engineering teams. Approximately half of the employers

interviewed reported no significant difference between Canadian-trained and international engineering graduates. However, half of the interviewees reported that international engineering graduates were less comfortable working in engineering teams.

Most employers who reported that international engineering graduates had some difficulty working in engineering teams attributed this difficulty to language barriers. Consistent with

"International engineering graduates are used to a more structured business environment."

Major Manufacturer

this view, these employers reported that the difficulties diminished as language skills improved. Some employers, however, felt that there were also cultural factors. In some countries, "engineer" is a social designation, as well as an occupational designation. As well, in many countries a greater degree of hierarchy and structure is the norm. The team-based organizational model, it was noted, is more prevalent in North America.

"Some international engineering graduates are very good, while others don't quite get it [i.e., how to work in teams]"

Major Manufacturer

Several employers, it should be noted, felt that most "engineers", regardless of where they acquired their training in Canada or elsewhere, had some difficulty adjusting to a team-based organizational model.

EXPLAINING TECHNICAL ISSUES

"International engineering graduates (except for the U.S.) are inferior to Canadian trained professional engineers because of language and cultural differences [in explaining technical problems to non-technical staff]. The engineers from the [some countries] are more abrupt in their communication style..."

Major Manufacturer

"If a international engineering graduate has the language skills – then he or she can present problems and solutions very well."

Major Manufacturer

Most, although not all, employers found international engineering graduates less capable of explaining technical problems and options to non-technical staff. The majority of employers attributed this weakness to language difficulties. However, as with the ability to work in teams, some employers also considered cultural factors to be relevant. One employer noted that, in his experience, many international engineering graduates were not accustomed to explaining technical issues to non-technical staff or having a reporting relationship to non-technical staff.

It should be noted that some employers also felt that many Canadian-trained engineers also have difficulty in explaining technical issues to non-technical staff.

KNOWLEDGE OF NORTH AMERICAN BUSINESS PRACTICES

Knowledge of North American business practices was another area of particular weakness reported by companies. More than three-quarters of those interviewed indicated that international engineering graduates were particularly weak in their understanding of North American business practices. To some degree, this also applied to engineers trained in the UK. For some employers, lack of knowledge of North American business practices is not a

significant consideration if the engineers are doing design work or do not need to be familiar with regulatory requirements. However, where engineers are involved in selling or in customer support, familiarity with North American business practices is important. The absence of this familiarity is a significant barrier for international engineering graduates. One major manufacturer commented on the general lack of understanding of business economics among international engineering graduates. Other studies have found that an increasing number of engineering positions require an understanding of both business processes and business economics. International engineering graduates are at a disadvantage in securing such positions. The effect may be to channel international engineering graduates into more technical positions where their lack of understanding of North American business practices is sometimes less consequential.

Most employers felt that it took approximately two years for an international engineering graduate to become familiar with North American business practices. Particular reference was made by a Quebec-based employer to courses in business practices offered by the OIQ.

One employer commented that in some engineering fields, North American technical standards differ from the standards used in other parts of the world. International engineering graduates are often not familiar with North American technical standards.

"The international engineering graduates operate half as well as Canadian trained professional engineers in their knowledge of Canadian business practices. This is a cultural thing – they do not recognize the importance of economics and finances. They are not familiar with how to make sound business decisions – they are more technical and have difficulty understanding financial considerations."
Major Manufacturer

"It only took a short time for the international engineering graduates to understand and adopt Canadian business practices."
Major Utility

"If it is the international engineering graduate's first job in Canada, there is a little bit of a period required to understand Canadian business practices... After 1–2 years the foreign-trained engineer has equivalent knowledge."
Consulting Firm

SECOND LANGUAGE ADVANTAGES OF INTERNATIONAL ENGINEERING GRADUATES

Some employers noted that there were advantages to international engineering graduates with second language abilities. This observation applied mainly to companies with branches, customers or suppliers in Europe and Asia. For at least one interviewee, this advantage was of particular importance.

SALARIES OF INTERNATIONAL ENGINEERING GRADUATES

More than one interviewee noted that salaries for international engineering graduates who are recent immigrants are generally lower than salaries for Canadian-trained engineers with approximately equivalent professional experience. In practical terms, this usually means being hired into a lower-paid classification. The lower salary reflects chiefly the skills weaknesses noted in this section, i.e., English (or French) language proficiency, the ability to work in teams, the ability to explain technical issues to non-technical staff, and knowledge of North American business practices. The study did not explore the amount of this salary differential or the rate at which the differential diminishes. Nevertheless, it should be noted that the recently immigrated, international engineering graduates bear the cost of non-technical skills weaknesses both in reduced employment options and also in lower salaries. The interview results suggest strongly that these reduced employment options and lower salaries are attributable chiefly to weaknesses in non-technical skills and not to deficiencies in technical skills.

PROPENSITY FOR EMPLOYMENT-RELATED TRAINING

Two-thirds of the employers interviewed reported that international engineering graduates were more interested in pursuing additional training than Canadian-trained engineers. The

"The international engineering graduates are more aggressive about pursuing additional technical training. They are all interested in receiving additional training."

Major Utility

remainder — with one exception — judged foreign-trained and Canadian-trained engineers to be comparable in their propensity for employment-related training. Only one interviewee suggested that international engineering graduates were less inclined to pursue employment-related training.

One interviewee felt that international engineering graduates tended to be more specialized than Canadian-trained engineers. Other interviewees noted that the international engineering graduates whom they recruit often have advanced engineering degrees (which frequently implies a greater degree of technical specialization). There is a suggestion in some of the interviews that this creates a tension. The additional training which some international engineering graduates are said to prefer relates to their areas of specialization. However, the employment-related training that their employers wish them to pursue is more often related to business practices and non-technical skills.

In some respects, comparisons with Canadian-trained engineers are not germane. What is important, and underscored by virtually all interviewees, is that international engineering

"International engineering graduates are 120% keener in advancing their technical base than Canadian-trained engineers. One of our international engineering graduates has his doctorate and another has his master's degree. They are generally less interested in advancing into a managerial role, but are more interested in enhancing their technical skills."

Major Utility

graduates have considerable keenness in taking additional training that will improve their professional prospects. This interest in additional training creates a potential opportunity for regulatory bodies to address the career needs of international engineering graduates and thereby strengthen their identification with the Canadian profession and with the Canadian system of professional licensure.

TRAINING NEEDS

Employers identified three areas in which international engineering graduates often require training:

- English (or French) as a second language,
- Business practices,
- North American technical standards

As well, while not explicitly addressed, the interview results suggest that many international engineering graduates may benefit from an internship programme that is designed with their distinctive needs and previous training and experience in mind.

ENGLISH (OR FRENCH) AS A SECOND LANGUAGE – E(F)SL

Employers were unanimous in identifying improved English (or French) skills as the single most important skill area for international engineering graduates to address. There are at

"The most important training required for them is to improve their writing and oral skills."

Major Utility

least three broad levels of E(F)SL that can be identified. The first is basic English (or French) communication. These programmes are typically offered by Boards of Education, colleges, and community-based organizations. The focus of basic E(F)SL is learning elementary language skills that bring the individual to a certain minimum level score on a standard examination, such as TOEFL or TSE. It is unlikely that the regulatory bodies would wish to enter this highly specialized field of adult education.

The second level of E(F)SL may be termed *E(F)SL for Professionals*. At this level, individuals already have a basic command of English (or French), but require polishing and practice to bring their oral language skills to the level that is expected of a person in a professional occupation.

Again TOEFL and TSE are the benchmark examinations. The score levels would be commensurate with those that are required by the regulatory bodies for licensure. Significantly, E(F)SL training to bring an individual to this level is not as readily available. Nor does training at this advanced level receive the same degree of government support. When employers refer to language skills deficiencies, it is chiefly language skills at this level that they intend. In partnership with post-secondary institutions, the regulatory bodies may be able to address this gap for international engineering graduates. Given the importance of language skills, the regulatory bodies may be able to attract corporate interest in supporting such programmes. Without doubt, training in *English (or French) as a Second Language for Professionals* would be seen as an important contribution by both companies and international engineering graduates.

The third level of E(F)SL that is relevant to international engineering graduates is may be termed *Technical E(F)SL*. This type of language training focuses on writing, presenting or explaining technical matters. The focus on technical communication distinguishes this type of E(F)SL training from the first and second levels. *Technical E(F)SL* is occupationally specific. There are few, if any, opportunities for international engineering graduates to take courses in Technical E(F)SL. Such courses as are offered, for example through the University of Toronto's Professional Development Institute, are not focused on second language learners. Among other professions, the Manitoba College of Medicine offers a special course in "Canadian Communications for Physicians Trained Abroad."

"The most important training required is writing skills. The engineers at [our company] are required to write technical and non-technical documents."
Consulting Firm

BUSINESS PRACTICES

Employers identified three areas of business practice knowledge where international engineering graduates are at a disadvantage. The first of these is a general appreciation of business culture and business practices in North America, noting the differences in practices here and in other parts of the world. The second important area of business knowledge is bidding, tendering and contract administration from both the purchaser and supplier perspective. Finally, some employers also pointed to the need for international engineering graduates to be trained in the basics of regulatory compliance — chiefly health and safety, environment and labour standards. The first of these areas of business knowledge is specifically focused on the needs of international engineering graduates. The other two areas are similar to the type of training that has been suggested by some employers as appropriate to the curriculum for engineers-in-training.

"International engineering graduates are not familiar with relevant regulations."
Major Manufacturer

"International engineering graduates need more exposure to business practices and guidelines relevant to their industry. They need to be familiar with Industry Canada, CRTC, FCC, etc. "
Major Utility

NORTH AMERICAN TECHNICAL STANDARDS

As noted, in certain fields, North American technical standards differ from those in many other parts of the world. Knowledge of these technical standards is critically important for some engineering jobs. International engineering graduates who lack this knowledge can be at a serious disadvantage. However, it is debatable whether the regulatory bodies can play a role in addressing this problem. Engineering technical associations and professional development centres may be better vehicles for providing access to such training.

"The biggest issue for an international engineering graduate is to learn all the new codes and standards that are common to North America, but not the rest of the world."
Consulting Firm

SPECIALIZED INTERNSHIPS FOR INTERNATIONAL ENGINEERING GRADUATES

As noted earlier, many international engineering graduates are recruited into positions that would not normally be described as entry-level. Consequently employers do not expect to provide the same degree of supervision as would be required for an entry-level position, nor do they plan to make available the mentoring that might be provided to a recent graduate. Many international engineering graduates have significant work experience prior to immigrating. As well, the average age of many international engineering graduates is higher than that of recent Canadian graduates. In light of these considerations, some employers may be impatient with licensing requirements that, in their view, do not take sufficient account of the distinct circumstances of international engineering graduates. The regulatory bodies may wish to consider specialized internships for international engineering graduates that acknowledge that these individuals have a different status and different needs than recent graduates.

AREAS FOR DISCUSSION IN PHASE II

The interviews conducted for this study suggest a number of general findings:

- The term “international engineering graduates” covers a broad spectrum of individuals. At one end of the spectrum are engineers who were trained in an English-speaking jurisdiction, such as the US, the UK or Australia. These individuals are viewed by employers as having technical qualifications that are equivalent to those of Canadian-trained engineers. Mid-way in the spectrum are engineers who trained in non-English speaking jurisdictions and who hold post-graduate qualifications. These individuals often lack language skills and knowledge of North American business practices. Nevertheless, they are valued by employers for their technical specialization and will often be hired into engineering positions. Further along the spectrum are similar individuals who lack post-graduate training, but who had significant practical experience prior to immigrating to Canada. These individuals may be hired either into engineering positions or into technologist positions, depending on how an employer assesses an individual’s suitability. At the far of the spectrum are recent graduates of universities in non-English-speaking countries whose undergraduate programs are not judged commensurate with Canadian (and *Washington Accord*) standards and who have little or no practical engineering experience. Employers will typically likely hire these individuals into technologist positions, rather than engineering positions.
- Although none of the employers interviewed made reference to the *Washington Accord*, they nevertheless appear to treat engineers trained in jurisdictions that are party to the *Washington Accord* as equivalent in technical skills to Canadian-trained engineers.
- None of the employers interviewed found international engineering graduates lacking in technical proficiency. This applied equally to engineers trained in jurisdictions that are not party to the *Washington Accord*.
- Proficiency in English (or French) is the key factor in determining an employer’s assessment of an international engineering graduate’s suitability for employment.
- Though secondary to language proficiency, knowledge of North American business practices is also an important consideration for employers. However, this factor is more likely to affect the level of employment into which an international engineering graduate is hired whereas language proficiency tends to determine whether an individual is hired.

- Most engineering-intensive employers have experience recruiting and managing international engineering graduates. In many of these companies, individuals who obtained their engineering education outside Canada now occupy managerial positions. Companies that judge a foreign-trained individual suitable for engineering employment are unlikely to allow the absence of professional registration to deter them from recruiting or promoting such a person, if a license is not legally required. This is especially the case where the international engineering graduate holds post-graduate qualifications. The significant increase in the number of international engineering graduates seeking employment may be leading some companies to reconsider the importance they previously attached to professional licensure.
- To maintain the credibility and standing of professional licensure among employers in sectors where registration is not legally required, it is in the strategic interests of the regulatory bodies to have policies and programmes that demonstrate an understanding of the distinctive circumstances and career challenges of international engineering graduates. The regulatory bodies need to avoid a situation in which there is a loss of support for professional licensure among both international engineering graduates and the companies that employ them. This will be particularly important as a growing number of international engineering graduates advance into managerial positions.
- Upon review of this information, it was noted that lack of Canadian cultural and technical knowledge may hinder IEGs in obtaining work. Even a person with more than ten years of overseas experience would be unfamiliar with such things as Canadian codes, products, construction costs, specifications, tendering processes and construction law.
- The regulatory bodies should consider partnering with post-secondary institutions to offer programmes in *English (or French) as a Second Language for Professionals*. These programmes would assume a strong level of proficiency in basic English (or French) language skills. The purpose of this advanced training would be to assist international engineering graduates in polishing their English (or French) language proficiency to a level that is suitable for professional employment. This training would cover the gap between proficiency scores commonly achieved by graduates of basic ESL or FSL programmes and the proficiency scores required by the regulatory bodies for professional registration.
- The regulatory bodies should consider partnering with professional development centres, where they exist, to offer programmes in *Technical English (or French) as a Second Language for Engineers*. This training would focus on the oral and written presentation of technical matters.
- The regulatory bodies should consider facilitating or offering training in essential North American business practices. Among the topics covered by this training would be:
 - tendering, bidding and administering contracts,
 - basic regulatory compliance under health and safety and environmental statutes,
 - organizational practices (especially team methods of organizing engineering work),
 - business development and client relationships.
- The regulatory bodies should consider developing a special internship program for international engineering graduates that would take account of their distinctive circumstances and accelerate their progress towards professional registration.
- Employers will be involved in the Steering Committee of Phase II.

APPENDIX G

Interview Results — Employers of IEGs

The purpose of this section is to provide an overview of the experience of Canadian employers with international engineering graduates. The study is based on 21 interviews with engineering managers or human resources managers in companies that employ a minimum of five engineers. The results of the interviews reflect the individual experience of these engineering managers or human resources managers with international engineering graduates over the past three to five years.

In conducting the interviews, the researchers did not explicitly distinguish between international engineering graduates who received their engineering education in jurisdictions that are parties to the *Washington Accord*⁵² on mutual recognition and individuals who received their training elsewhere. Nor did they explicitly distinguish between international engineering graduates who received their training in English and those who were not trained in English and for whom English is a second language. Nevertheless, as anticipated, interviewees immediately made these distinctions. The comments of one engineering manager were representative: “We

52 The following table lists the signatories to the *Washington Accord*. The *Accord* provides for mutual recognition of educational requirements, not for other licensing or certification requirements.

Country	Signatory Organization	Entry Year
Australia	Institution of Engineers, Australia	1989
Canada	Canadian Engineering Accreditation Board of the Canadian Council of Professional Engineers	1989
Hong Kong	Hong Kong Institution of Engineers	1995
Ireland	Institution of Engineers of Ireland	1989
New Zealand	Institution of Professional Engineers, New Zealand	1989
South Africa	Engineering Council of South Africa	1999
United Kingdom	Engineering Council	1989
United States	Accreditation Board for Engineering and Technology	1989

do not regard engineers from the U.S. or the UK as foreign trained.” Thus, we have reason to believe the findings from this study are chiefly relevant to the career challenges faced by engineers who received their training in Asia, Eastern Europe, or Latin America.

It must also be stressed that the interviews conducted for this study should not be equated with a survey. The interviewees were randomly selected, but the interview panel was not of sufficient size to make this study equivalent to a survey. Nevertheless, there are a number of findings that were broadly confirmed by all (or virtually all) interviewees. These findings may suggest measures that could assist international engineering graduates in pursuing their professional careers in the Canadian regulatory context.

The selection of companies reflects the settlement patterns of recent immigrants. Table No. 1 summarizes the sectors and regions represented by the interviewees:

Table No. 1
Distribution of Companies Participating in Interviews

	Utilities	Consulting	Manufacturing	Total
Atlantic	2			2
Quebec		2	2	4
Ontario	1	2	10	13
Prairies			1	1
B.C.			1	1
Total	3	4	14	21

The Interview Protocol is attached at the end of this appendix.

In total, the 21 interviewees who participated in the study had direct experience hiring or managing approximately 450 international engineering graduates over the past three to five years. The vast majority of these engineers received their engineering education in jurisdictions that are not party to the *Washington Accord*. For most of these individuals, English was a second language. Table No. 2 summarizes the number of times a country was mentioned as the country-of-origin for international engineering graduates.

Table No. 2
Number of Time Specific Regions or Countries-of-Origin were Mentioned by Interviewees in Reference to International engineering graduates

Region or County of Origin	Mentions
Eastern Europe	11
UK	9
Other East Asia, excl Singapore, HK	7
Middle East/North Africa	7
South Asia	5
China	3
Western Europe	4
US	4
Latin America	2
Hong Kong	3
Japan	2
Singapore	2
Africa	1

INTERVIEW PROTOCOL

1. Over the past 3–5 years, very approximately how many international engineering graduates reported to you?
2. Where did these international engineering graduates receive their university training?
3. In your company, do international engineering graduates generally work at the same level as Canadian-trained professional engineers or are they more likely to work at technician/technologist level?
4. In comparison with Canadian-trained professional engineers, how would you evaluate the international engineering graduates' knowledge of engineering theory?
5. In comparison with Canadian-trained professional engineers, how would you evaluate the international engineering graduates' practical experience in solving relevant engineering problems?
6. In comparison with Canadian-trained professional engineers, how would you evaluate the international engineering graduates' ability to work with other members of the engineering team?
7. In comparison with Canadian-trained professional engineers, how would you evaluate the international engineering graduates' knowledge of Canadian (or North American) business practices?
8. In comparison with Canadian-trained professional engineers, how would you evaluate the international engineering graduates' ability to explain engineering problems and solutions to non-technically trained persons?
9. In comparison with Canadian-trained engineers, how would you evaluate the international engineering graduates' interest in pursuing additional technical training?
10. What additional training, if any, do you think would be most relevant to international engineering graduates to enable them to advance their career in Canada in the engineering profession?

