Mobility of Engineers in Europe

A Pragmatic Approach from the Engineering Profession

Abstract

Engineers are known as having strong analytical skills and being problem solvers – especially when problems are complex and ill-defined. Engineering is intrinsically a global profession - technology and its application will cross borders regardless of geographical, cultural or political barriers. In this context the problem of global mobility of engineers themselves is but another complex problem to be solved by engineers. This paper discusses the work to date undertaken by the engineering profession in Europe, specifically the initiatives of FEANI, the European Federation of National Engineering Associations, to facilitate the mobility of engineers.

Keywords: Engineers, Mobility, FEANI, EUR ING, www.feani.org

Introduction

The globalised nature of the engineering profession requires the supply of professional engineering talent in all governmental and industrial sectors across the globe. The shortage of engineering talent in many European economies is well documented in the popular media especially in the growing sectors of Information Technology and renewable energy. The shortage of engineering talent represents a loss to the economy and humanity of new products and services. "*Shortages hamper economic growth, create wage inflation and impede business formation and development*," [1]. By contrast there are countries inside and outside the EU with an oversupply of engineering talent, however, the movement of talent across European borders remains a complex issue. Engineers are problem solvers and it is therefore no surprise that the engineering profession has organised itself to facilitate mobility of engineers and improve the recognition of engineering qualifications and professional experience. This paper outlines some of the initiatives undertaken by European organisations representing the engineering professions in different jurisdictions.

Engineering Mobility in Context

The globalised perspective of engineers is probably unique among the professions. Mobility can be viewed from a number of perspectives:

1. **Physical Mobility**: In this case a qualified engineer crosses from one European jurisdiction to another in search of work or to provide services.

2. **Employer Mobility**: This is as the case above, however the employee engineer moves between countries but within the same company. The distinction here is that the employee does not necessarily need to be recognised by in-country professional or statutory organisations and the employee is producing work to agreed global standards. An example is working on medical devices or aviation components where the prevailing standards are based on global rather than national standards. Employees moving intra-company may not appear on any official migration statistics.

3. **Task Mobility**: The engineer based in country A is producing work for country B. The engineer may never visit country B but may have to demonstrate to the authorities in country B that he is qualified to undertake the work. An example may be an engineer based in Spain designing a hospital to be built in Ireland – the engineer will have to demonstrate competence in his field to the Irish Authorities. Augusti [2] refers to this as 'virtual mobility' however the author considers that the phrase 'virtual' can be misinterpreted in other contexts.

Engineering Formation – the underlying Principles for mobility

Recognition of academic and professional qualifications for mobility is complex, however, there are a number of agreements which will ease the path for migrant engineers. Many of these were put in place on a reciprocal arrangement between the Professional Engineering Institutions (PEI) in different jurisdictions, often in response to specific migration/economic needs. These are known as Mutual Recognition Agreements (or Mutual Exemption Agreements) and depending upon the agreement recognises the substantial equivalence of academic and/or professional qualification between PEIs. An example would be that Engineers Ireland recognises an engineer holding the professional title of Chartered Engineer from the Institution of Civil Engineers in the UK as equivalent to the professional qualification of Chartered Engineer in Ireland. At first glance determining equivalence of qualifications appears quite simple, however, to achieve this requires a mutual understanding between both organisations of the formation process of a professional engineer in the other jurisdiction i.e.

i. The academic period of study at third level
ii. The post academic period of application of academic learning
iii. The demonstration of the application of this knowledge by presentation in a professional report, with evidence of continuing professional development (CPD) and assessment by interview in front of a panel of peers.

Such mutual recognition agreements have their limitations but represent a key lever in supporting mobility of engineers.

A Europe-wide Approach

In the years following the end of the Second World War, several international technical associations were established. In June 1949 approximately 340 engineers met in Konstanz, Germany for a congress on the topic of the 'Role of the Engineer in Modern Society'. Amongst the motions which were adopted included the following :

"That the participants jointly to pursue the task already begun by setting up an international organisation , temporarily limited to Europe, whose goal will be to strengthen the presence of engineers in every national and international movement of economic and social dimension". [3]

Following this congress FEANI - Fédération Européenne d'Associations Nationales d'Ingénieurs (European Federation of National Engineering Associations) was established in 1951 by seven European countries. Today FEANI is a European federation, registered under Belgian law with 32 full member countries. It represents the engineering profession in Europe and has been recognised by the European Commission in a declaration on March 10th 1994. The FEANI mission is :

"*FEANI together with its national members will promote the mobility, the education and the professional development if engineers in order to enhance the visibility of the value of engineers to society*".

The aims of FEANI are :

I. To affirm the professional identity of engineers in Europe.
II. To strive for a single voice for the engineering profession in Europe whilst acknowledging its diversity.

As an engineering organisation it is therefore no surprise that FEANI pursued practical aspects of achieving these goals. To date there have been two major initiatives to support the engineering profession in Europe – the EUR ING professional title and the engineerING card.

I. EUR ING title

FEANI introduced the EUR ING title in 1987. The EUR ING title delivered by FEANI is designed as a guarantee of competence for professional engineers, in order to facilitate the movement of practicing engineers within and outside the geographical area represented by FEANI's member countries. It is also a means to establish a framework of mutual recognition of qualifications in order to enable engineers who wish to practice outside their own country to carry with them a guarantee of competence to provide information about the various formation systems of individual engineers for the benefit of prospective employers to encourage the continuous improvement of the quality of engineers by setting, monitoring and reviewing standards.

Holders of the EUR ING title are listed in the FEANI Register, a database maintained by the Secretariat General in Brussels. There are currently 32,886 European Engineers registered with the title (December 2014).

The European Commission, in a statement to the European Parliament, has recognized the FEANI Register and the EUR ING title as valuable tools for the recognition of national diplomas among member states :

"*The FEANI scheme is an excellent example of self-regulation by a profession at European level and it provides a model for other professional groups in the technical and scientific sector, such as chemists and physicists. The FEANI register recognizes and builds upon the diversity of forms of engineering education which exist in the Community and can adapt to any changes which may be decided upon at national level. The procedures for dealing with applications for registration also provide a good respective expertise. Registration on the FEANI register indicates that, whatever the duration or content of his or her initial training, the engineer has reached a certain level of professional competence, certified by his or her peers both at national and European level. Bearing in mind that Member States are required by the case law of the Court to take post-diploma professional experience into consideration, when reaching their decision on recognition, the Commission considers that an engineer who has obtained the title of EUR ING should not normally be required to undertake an adaptation period or sit an aptitude test, as provided for in Article 4 of Directive 89/48/EEC*."

The criteria for the EUR ING title are based on the education and work experience of the engineer and adhere to the model of formation presented above.

The qualification of the engineer, which falls into two main categories of different but equally important competencies - more theory oriented and more application oriented - first requires an approved engineering education. But full professional competence is only reached after gaining valid professional experience. The minimum requirements are [4]:

1. A minimum of 12 years education at primary and secondary level. Typically completed at the age of about 18 years. This is followed by a minimum total period of seven years formation - education, training and experience.

2. Minimum three years of engineering education successfully completed by an official degree, in a discipline/programme and delivered by a university or other recognized body at university level, recognised by FEANI. A list or recognised education institutions is listed on the FEANI Index (http://www.feani.org/site/index.php?id=263). Normally the engineering education has been accredited or quality assured by an independent body. FEANI works closely with European accreditation bodies such as ENAEE and actively engages with global engineering bodies such as WFEO and the International Engineering Alliance to harmonise professional standards.

3. A minimum of two years valid professional experience which has been verified by employers of the engineer. The duration of professional engineering experience shall include the following :

    a. The solution of problems requiring the application of engineering science in the fields such as research, development, design, production, construction, installation, maintenance, engineering sales and marketing, and
    b. Management or guiding of technical staff or
    c. The financial, economical, statutory or legal aspects of engineering tasks, or
    d. Industrial and/or environmental problem solving.

In addition to these formation requirements, EUR ING holders are required to comply with a Code of Conduct respecting the provisions of the FEANI Position Paper on Code of Conduct: Ethics and Conduct of Professional Engineers.

II. engineerING Card

The engineerING card is a FEANI initiative to ease cross-border employment and professional mobility. This has been under active development within FEANI for a number of years and was formally introduced at a meeting of the FEANI General Assembly in Sofia 2010.

The European Union has a stated goal of achieving mobility between professions across Member States. This is underpinned by legislation – e.g. the former EU Directive 2005/36, now EU Directive 2013/55 on the Recognition of Professional Qualifications imposes obligations on Member States with regard to the mobility of doctors, lawyers, architects and engineers. In the review of the operation of this Directive, the Commission has shifted focus to speeding up recognition procedures and identifies some mechanisms to achieve this including the development of a European professional card.

The Commission set up an expert group to report to them on the idea of developing portable Europe-wide 'professional cards' which could speed up the exchange of information about a professional's credentials. A professional could carry a card certifying his/her qualifications and legal status as a professional established in a Member State. The card could, potentially, carry other information too. For example, a research project has been completed for a professional card for health professionals – an 'HPRO card'.

The concept of a professional card for professionals is not new and in the case of engineers there have been a number of attempts to seed the market for such a card. At the FEANI (European Federation of National Engineering Associations) General Assembly in Sofia (October 2010) members voted overwhelmingly to pursue the goal of introducing and promoting the 'engineerING card'.

The engineerING card is FEANI's response to the increasing demand for internationally mobile engineers by enterprises of all sizes as they explore international markets and support

their customers' global expansion. Regional shortages of certain disciplines of engineers are met in the short and medium term by the recruitment of engineers from other countries. The process of getting recognised in another country can take months and frequently job opportunities are lost as a result.

Engineers and employers across Europe require a tool that:

- shows a comparable educational profile;
- provides recognition based on international standards and,
- is easy to use, update and administer.

While there is no mandatory requirement for a professional engineer to hold a card at present, the engineerING card provides a number of features that make it attractive to both employers and professionals:

- completeness – the card demonstrates that the holder has specific achievements in engineering education, professional experience and continuing professional development
- standardisation – the card is based on EU standards (European Qualification Framework), EUR-ACE and FEANI
- reliability – each national engineering organisation verifies the card holder's details (as is the case for EUR ING, Chartered titles etc.) and
- flexibility – through decentralised administration.

The fundamental concept is that the engineerING card resembles a European driving licence. The card is not 'smart' and does not contain an embedded chip containing personal information. The front of the card is illustrated in Figure 1. However the pertinent information is on the reverse of the card as illustrated in Figure 2.

The engineerING card [5] uses different categories to provide an indication of the level of academic qualification, experience and Continuing Professional Development. For example, the documentation of the degrees on the engineerING card takes place in accordance with the European Qualifications Framework in the following categories:

A1 Bachelor, short cycle engineer (3 years)

A2 Master, long cycle engineer (5 years) and

A3 PhD, doctoral degree.

These categories are in accordance with the European Qualifications Framework and in line with EUR-ACE Framework and/or FEANI-Index-criteria.

Though professional experience is not a pre-requisite (the engineer may only have graduated) the following categories are used:

B1 free economy

B2 civil service

B3 self-employment

These classifications refer to the previous three years' experience. Though Continuing Professional Development certificates are not a requirement for obtaining the engineerING card the documentation of the further education takes place in the following categories:

C1 seminar with attendance certificate

C2 seminar with final examination and

C3 Continuing Professional Development with examination and diploma

The engineerING card has a validity of 10 years and is issued by the national engineering organisation. The card is issued based primarily on where the engineer gained academic qualification – though there can be exceptions to this. Each national engineering organisation verifies the cardholder information. The card is in the English language along with the official language of the country of issue.

The governance of the process is assured at both national level by the national engineering association and a central European FEANI Register Committee. The national association will define national standards, decide on acceptance and issue the engineerING card; and compile a national engineering register. The FEANI Register Committee defines standards, quality assurance, monitoring, compile a list of all issued cards (so for example if a person is declined the card in one country they cannot apply elsewhere) and establish a board of complaint.

Though the card needs only to be renewed every 10 years, there will be a facility to allow engineers to update education and professional experience details. This happens on the national register updates. These will have to be verified by including scanned versions of certificates, work experience records and CPD, thereby maintaining the verifiable integrity of the cardholder information. Information can be updated at any time but may incur a fee.

At present 12 FEANI members are committed to introducing the card – some member organisations have issued cards since 2012. The implementation of the engineerING card across all EU Member States will take time and implementing a central database will be a pre-requisite for the smooth operation of the scheme. As a European professional card for engineers, the engineerING card can make a significant contribution to simplifying cross-border employment and mobility of engineers within the EU. By documenting internationally recognised standards, it will also promote transparency on the engineering job market, thereby making it easier for companies to select suitably qualified employees from across Europe.

The EU Commission is actively looking to the introduction of a non-physical professional card to support implementation of EU Directive 2013/55/EC. The experience gained by

FEANI in defining and implementing the engineerING card will be shared with the EU Commission in the following years.

Figure 1 : engineerING card – Front

Figure 2 : engineerING card – Reverse

Conclusion :

European mobility for professionals is fraught with difficulties, however, as pragmatists engineers have led the way in addressing the issues. In the European context FEANI has pioneered the development of a recognised European professional title and an independently verified card to support engineers' mobility.

These initiatives address only the structural issues. There will always be many cultural, linguistic and private (family) issues that will impact on a person's ability or choice to migrate for work.

Damien OWENS

References :

[1] "Growth fears surface as Germany faces shortage of skilled labour" – Sarah Gordon, Financial Times, June 29, 2014.

[2] Augusti, G. , European Engineering Formation: The Problem of Trans-national Recognition, European Journal of Engineering Education, Vol. 24, No. 1, 1999.

[3] FEANI Strategic Plan, version 4th August 2013 presented at FEANI General Assembly, Skopje, FYR Macedonia.

[4] FEANI National Monitoring Committee Handbook

[5] FEANI engineerING Card Handbook.

Acknowledgements :

The assistance of Dirk Bochar, FEANI Secretary General and Lars Funk, Bereichsleiter, Verein Deutscher Ingenieure (VDI) is greatly appreciated.

Biography

Damien Owens is a Chartered Engineer and is Registrar and Membership Director at Engineers Ireland. He holds Bachelor degrees in Mathematics and Electronic Engineering from Trinity College Dublin, Master Degree in Engineering from Trinity College Dublin and Masters in Business Administration from the Open University (UK).

He has extensive experience in product development and strategic alliances and has delivered papers internationally on these topics. He sits on FEANI's European Monitoring Committee where he is vice chair. He also sits on the Governing Group of the International Engineering Alliance where he is Deputy Chair of the Dublin Accord. He is a member of the Electronic Engineering and Computing Group at the Royal Irish Academy.