European Engineer Qualification for Russia

THE RUSSIAN UNION OF SCIENTIFIC AND ENGINEERING ASSOCIATIONS
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The history of engineering education standards began in June 1949, when 340 European engineers met for a congress "The role of the engineer in the modern society". The participants decided to establish an international organization, whose aim would be to strengthen the role of engineers in all national and international movements of economical and social dimension.

The Federation of international and national engineering associations was created in September 1951. Seven European countries - Austria, Belgium, Switzerland, Germany, France, Italy and Luxembourg - were the founders.

In 1956, due to the increase of member countries, the organization's name was changed to European Federation of National Engineering Associations (FEANI).

Today associations from 29 European countries, including Russia [1], are represented in FEANI, uniting more than 350 national engineering associations and about 3.5 million engineers. The Federation has a consultative status with UNESCO, UNIDO and the Council of Europe; it is officially recognized by the European commission as an expert in engineering education. It is also among the members of the World Federation of Engineering Organizations (VVFEO) which represent s approximately 8 million engineers around the world.

FEANI's objective is to affirm the professional status of engineers in Europe by:

- ensuring the high professional qualification of European engineers and its recognition around the world;

The article contains the requirements for obtaining the European Engineer (Eur Ing) title by Russian engineers. This title can place Russian engineers at the international level, and the preliminary accreditation of educational programmes allows universities' leaders to evaluate their educational process against the European standards.

- asserting the status, role and responsibility of engineers in society;
- promoting the professional interests of engineers and facilitating their free movement within Europe and worldwide;
- developing professional connections with other international organizations in the sphere of engineering;
- representing the engineers of Europe in the international organizations and other decision-making bodies.

FEANI's activity, especially with the attribution of the European Engineer (EUR ING) professional title, facilitates the recognition of high qualification certified engineers in Europe and strengthens their position, role and responsibility in society.

FEANI has one national member representing national engineering education of each member country. Russia is represented by the Russian Union of Scientific and Engineering Associations (RUSEA).

The Russian Union of Scientific and Engineering Associations is a successor of activity and traditions of Russian Technical Society, established in 1866 [2]. In December 1990, at the Founding Conference dealing with reorganization of existing public organizations, the RUSEA acquired its present name and the status of non-governmental independent public association.

RUSEA is comprised of 25 scientific and engineering public organizations established in different fields of science and engineering and uniting scientists, engineers and specialists on the basis of their professional interests. It also includes 49 regional unions of scientific and engineering organizations.

In 1991, the RUSEA became a member of the World Federation of Engineering Organizations (WFEO).

FEANI European Monitoring Committee (EMC) is a body consisting of independent experts.

The EMC makes decisions on registration of specialists as Eur Ing and supervises the work of the National Monitoring Committees (NMC) in order to maintain European educational standards. The EMC approves accreditation of schools and educational programmes.

The National Monitoring Committee is a national body, established in every FEANI member country, composed of representatives from national engineering associations, industry and education. Russian National Monitoring Committee was established in April 2009. It is headed by Yu. Gulyaev, member of the Academy of Sciences.

The Committee is composed of three boards: methodological board, accreditation board and registration board.

Among the members of the NMC there are leaders of Russian largest universities, industrial enterprises, design and construction organizations, public and professional engineering associations, as well as the representatives of government authorities.

It is the task of the Russian National Monitoring Committee:

- to facilitate licensing of educational programmes;
- to provide the EMC with the information on the structure of engineering education and the standards of individual schools and educational programmes;
- to review the professional engineering experience of an applicant before proposing his/her registration as Eur Ing.
- to review any changes or additions to the approved list of schools and programmes and notify the EMC about them.

THE EUR ING TITLE

The principal objective of the Eur Ing project is to develop a framework for engineering programme accreditation in the European higher education area in order to afford a means for comparing different qualifications, thus, promoting mobility and increasing career options for graduates.

Accreditation involves a periodical assessment of an engineering educational programme against the accepted

standards. It is conducted by independent peer review teams consisting of practicing engineers and educators.

The evaluation process normally involves both reviewing of data about the programme and a visit to the higher education institution in order to review its educational process organization.

The accreditation standards can be used in the evaluation of Bachelor and Master degree programmes in all branches of engineering according to the European Qualification Framework. The European Commission finances the EUR-ACE project [3], aimed at the establishment of European engineering education accreditation system, as defined by Bologna declaration, in order to establish the European Higher Education Area.

The establishment of a European accreditation system for the entire engineering sector is a major tool for engineering education quality improvement and assessment, as well as for the support of engineering qualification recognition and engineers' mobility within Europe.

The proposed European accreditation system is based on a set of common European Framework Standards for the engineering programme accreditation that includes:

- a common standard which will provide European status to all existing national accreditation procedures;
- guidelines for implementation of accreditation procedures in those countries where they do not yet operate, in order to assure the engineering education quality and to coordinate national and international requirements.

FEANI has established and maintains a list (the FEANI Index) of schools and educational programmes which meet educational standards set out by FEANI and are accredited or officially recognized on the national level. This Index defines the exact duration of study, academic title and characteristics of each programme.

The FEANI Index also includes the non-member countries having agreements with FEANI on the mutual recognition of their accreditation systems. The list includes information on the national body responsible for accreditation system and the list of accredited schools and programmes.

It can also include lists of independent schools and programmes from non-member countries, accredited by a member country.

FEANI maintains a Register to which the Eur Ing candidates are admitted provided they meet the established requirements [4]. The purpose of the Register is as follows:

1) To facilitate the practicing engineers mobility inside and outside the FEANI ambit and to establish a system of qualifications' mutual recognition in order to allow engineers willing to practice outside their countries present a certificate confirming their professional competence without any additional nostrification.

2) To provide a prospective employer with the sufficient data about the professional competences of the engineer.

3) To support continuous improvement of engineers' training quality by monitoring innovations and reviewing quality standards.

4) To provide a source of information about the variety of employment in member countries.

Educational and training systems in Europe vary considerably. Their value is estimated by FEANI and is based on the high standards of engineer's professional competence. Engineering education and engineering experience together define the professional competence level. European Engineer's professional competence includes:

- willingness to serve society and profession according to the code of professional conduct;
- a thorough knowledge of engineering principles based on mathematics and science as an essential element of profession;

- good engineering practice in a certain field of engineering;
- an ability to apply different theoretical and practical methods to analyze and solve engineering programmes and to use existing and new technologies in a certain field of specialization;
- knowledge of economical, quality assurance and equipment maintenance issues and ability to use technical information;
- an ability to work in teams on multidisciplinary projects;
- leadership skills including managerial, technical, financial and personal aspects;
- commitment to maintaining competence by continuous professional development;
- fluency in European languages sufficient for communication with colleagues throughout Europe.

There are two ways of a European Engineer registration:

- registration on the basis of higher professional education (takes place on the national level under the guidance of the FEANI National Monitoring Committee).
- registration on the basis of professional status (takes place on the European level under the guidance of the FEANI European Monitoring Committee).

The elements of engineering education are B, U and T, where:

"B" represents a high level of secondary education validated by one or more official diplomas awarded at the age of 18.

"U" represents a year (full-time or equivalent) of approved university programme provided either by a university or by the other university-level recognized organization, accredited by FEANI and included in the FEANI Index - "The List of Schools and Programmes".

"T" represents a year (full-time or equivalent) of training aimed at accumulating practical skills through work within technical fields, for example, in a factory, laboratory or other organization supervised and approved by a university as a part of the engineering programme.

The minimum standard for registration on the basis of education is:

B + 3U.

It means that an engineering programme must last at least for three years and comply with the condition B.

The elements of the professional status are the completed engineering education with the elements B, U, T and the professional engineering experience E.

"E" represents a year (full-time or equivalent) of engineering experience approved by FEANI.

For different categories of education FEANI considers different standards of professional status.

1) Education (school and program) is listed in FEANI Index.

The minimum standard for engineering status is 7 years. FEANI considers the specific educational programme duration (the number of U and T years).

The balance up to 7 years can be covered by an appropriate number of years of professional engineering experience according to the following scheme:

B + 3U + 2(U/T/E) + 2E.

2) Education outside the FEANI area.

For applicants whose engineering degree was obtained outside the FEANI area the school or the programme must either be in the International Section of the Index or be officially recognized in any of FEANI countries as equivalent to those listed in the Index. In this case the minimum standard is

B + EDUCATION + 4E.

Applicants holding a university degree in mathematics or natural science are eligible for registration in case their schools are listed in the FEANI Index.

If their country is outside the FEANI area, the programme must be equivalent to one listed in the FEANI Index. They are eligible for registration if they can prove a minimum of eight years of professional engineering experience and therefore meet the standards according to the following scheme:

B + EDUCATION +8 E (AT LEAST 35 YEARS OLD).

In such a case a very strict evaluation of their professional engineering experience takes place in order to ascertain that the eight-year engineering experience meets all the requirements.

In some cases professional engineering experience has been gained on the basis of the education that does not meet the above-mentioned requirements. Nevertheless, it is still possible to consider this alternative. However, very strict procedures will be applied to evaluate the professional status of such a candidate. The applicant must be at least 35 years old and must have no less than 15 years of professional engineering experience:

15E (at least 35 years old).

The FEANI European Monitoring Committee is in charge of the Eur Ing registration and of standard modification in the light of technological or other developments. These standards are reviewed at intervals of not more than 5 years.

Individuals can apply for registration if they are members of the engineering association represented in FEANI. Applications must be submitted to National Committees, not directly to the FEANI.

Individuals can apply to be registered on the basis of their education and professional status either at the same time or separately - on the basis of education first, and then on the basis of professional status.

The application form must be filled out in one of the three official FEANI languages - English, German or French. All required documentation must be attached and the fee set by the National Committee must be paid.

Russian Monitoring Committee (RMC) checks whether the school or programme successfully completed by the candidate are in the FEANI Index or are equivalent to those listed in the Index.

It also checks that the duration of the professional engineering experience meets the minimum requirement or that the candidate can be expected to achieve the required professional engineering competence.

Professional engineering experience should include the following elements:

1. The solution of engineering problems in such fields as research, development, design, production, construction, equipment installation and maintenance, sales and marketing.
2. Management of technical staff.
3. Management of financial, economical and other aspects of engineering tasks.
4. Management of industrial and environmental problems.

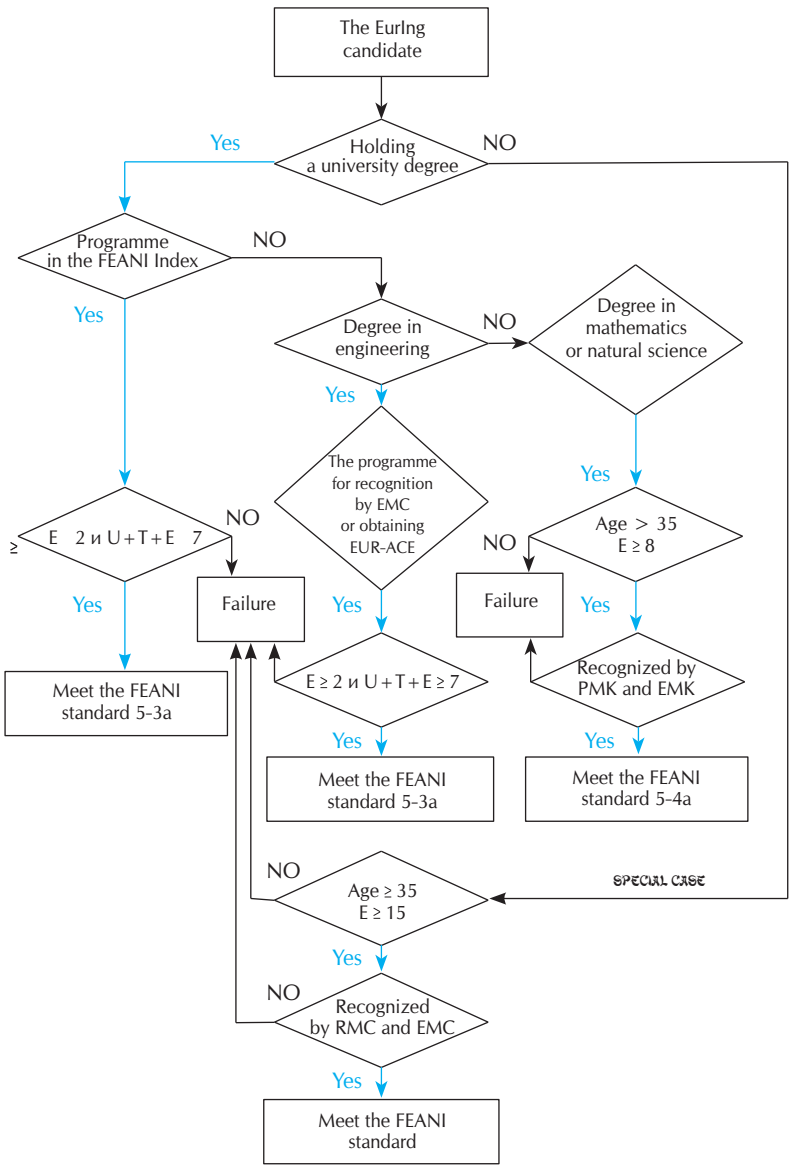
In order to enable the RMC to review the applicant's professional engineering experience, the application should be accompanied by its appropriate description. The purpose of this description is to assess the applicant's professional experience since graduation and the level of his/her professional competence in the chosen specialization. It should demonstrate how this experience gave him/her the opportunity to reach the level of professional competence required of a Eur Ing. In case there still are disputable issues, this analysis should include an interview held by the experienced engineers.

The RMC makes a decision upon directing the application to the EMC for registration and issuing certificates to successful candidates. Individuals registered on the basis of education must follow the FEANI Code of Conduct. The Code of Conduct contains ethical norms of professional engineers' conduct.

It does not substitute any ethical norms operating in the applicant's own country.

The main requirements of the Code are as follows:

All individuals listed in the FEANI Register as European Engineers must be conscious of the importance of science and technology for humanity and of their own social responsibility in their professional activity. They commit



themselves to follow the common European rules of conduct respecting the professional rights and the dignity of their colleagues.

The decisions and actions of engineers have a huge impact on the environment and society. The engineering profession imposes an obligation to work in the public interest and with regard for health, safety and sustainability.

Engineers are obliged to act with integrity, in the public interest and to exercise all their skills in carrying out their work.

Thus, they must:

- maintain their competence at the necessary level and only undertake tasks within the scope of their
- not misrepresent their educational qualification or professional titles;
- give an impartial judgment to their employer or clients, avoiding conflicts of interest, and observe the confidentiality requirement;
- take full responsibility for their work and the work carried out under their guidance;
- respect the personal rights of their colleagues and the legal and cultural values of societies in which they work;
- be prepared to public speeches on technical issues in the field of their competence.

The possible ways for Russian engineering specialists to obtain Eur Ingtitle are presented in the picture below.

The registration as Eur Ing is attested by a certificate prepared by the Secretariat General and signed by the President of FEANI. This certificate provides information on the duration and type of education.

Rejected applications are returned to the National Committee with the reasons explained. The registration should be renewed every 5 years through the RMC.

In July 2010, first Russian specialists were registered as Eur Ings at the meeting of the European Monitoring Committee in Dublin (Ireland).

The Eur Ing Certificates are awarded to successful Russian candidates by the Russian Monitoring Committee of FEANI.

CONCLUSION

Taking into account the need for engineering educational programmes public and professional accreditation system in Russia and entering the European Federation of National Engineering Associations which is officially recognized by the European commission as an expert in engineering education, the Eur Ing registration of Russian engineering specialists is an important step forward. This title places Russian engineers at the international level. The activity in this field is supported particularly by the Presidium of the Moscow Council of Rectors.

The principal objective of the Eur-Ing project is to develop a framework for engineering programme accreditation in the European higher education area in order to afford a means for comparing different qualifications, thus, promoting mobility and increasing career options for graduates.

The requirements for the Eur Ing registration allow the leaders of Russian universities to evaluate their educational process against the European standards and, in case they meet these requirements, to address the Russian Monitoring Committee of FEANI* on the matters of accreditation of engineering educational programmes and Eur Ing registration.

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