Int. J. Appl. Engng Ed. Vol. 7, No. 6, pp. 445–447, 1991
Printed in Great Britain.

0742–0269/91 $3.00+0.00

The SEFI, its Structure and its Aims

P. E. NÜESCH*
Swiss Federal Institute of Technology Lausanne, CH-1015, Lausanne, Switzerland

In the following I try to address some of the problems which engineering societies such as the European Society for Engineering Education (SEFI) and Internationale Gesellschaft für Ingenieurpädagogik (IGIP) face. I will not talk about the impact of 1 January 1993 on the engineering profession: I have done so several times and I am convinced that competent orators will be heard in engineering conferences on this subject. Furthermore, I will have to make a choice from the catalogue of problems since my time is restricted. The backbone of our society is the working groups, and several projects with other organizations. Thus, I will show how today's problems influence the work and the structure of our society and how we respond to the challenge.

THE FORMATION

THE classical breakdown of engineering studies into civil, mechanical and electrical engineering, which was still in use two decades ago, is no longer valid. New types of engineering studies, indeed new types of engineers, have arisen. The old categories have been replaced by new classifications such as environmental engineering and security engineering. The characteristic of these new studies is their interdisciplinarity. We see today a more horizontal structuring with common curricula for all types of engineers and a stronger specialization in the latter part of the study period. New curricula are required to respond to these new profiles.

In his exposé, Professor H. Ursprung estimates the half-life of the validity of the knowledge for an engineer at 5–10 years. This has led to new activities in continuing education and recycling courses. The European Society for Engineering Education (SEFI) has been instrumental in the creation of the International Association of Continuing Engineering Education (IACEE) which was founded in May 1989 and today has 346 members. An international body like SEFI has, for obvious reasons, a much easier task in continuing education while our influence in initial education is mostly reduced to a consulting position since universities refuse to be told what they should be doing. Besides the purely academic problems of the engineering curricula, we are also faced with highly diversified systems of education. Some schools specialize from the first semester, others admit no specialization and devote all their time to transmitting a general engineering culture, such as the French 'grandes écoles', e.g. the Ecole Centrale of Paris. Of course, the success of this generalist instruction is highly correlated with their elitist recruitment system. The SEFI working groups primarily concerned with questions of initial education are Curriculum Development, Computer-aided Instruction, Mathematics and Information Technology, while the working group on Continuing Engineering Education is concerned with further education.

INTERNATIONAL RELATIONS

Without an excellent international network the impact of SEFI would be negligible. We work with UNESCO in Paris and the EC authorities in Brussels. The contacts are permanent and are intensified for special projects. The responsibility for this activity lies with the Secretary General. The academic aspects of exchange programs are dealt with by our working group on International Relations. Currently our major concern is the organization of the diploma period in another country. We recently published the second edition of the European Thesis Abroad Program (ETAP). Relations with other international organizations such as FEANI and IGIP lie in the hands of the president. With respect to FEANI an *ad hoc* working group was created. All three presidents have agreed to meet once a year for an informal 'tour d'horizon'.

The lack of any co-ordination up to now is highlighted by the fact that the annual conferences in 1991 of IGIP and FEANI fell on the same dates. But the collaboration has to go beyond mere administrative details. A concerted action with respect to the implementation of general directives for reglemented professions adopted by the EC on 21 December 1988 is most desirable. Countries like Austria and Switzerland will not accept any discrimination against their graduates because their diplomas have been issued by an institution of an EFTA country. If the three societies want to pool their efforts, they have to do this by bringing to this endeavour a clear profile. The distinctions between FEANI and SEFI are clear and do not need to be rediscussed. The aims of IGIP and SEFI are however very similar.

* P. E. Nüesch is Professor, President of SEFI, 1990/1.

The membership compositions of the two societies are rather different. In some areas in which IGIP is strong, SEFI is weak, and vice versa. The main difference lies in the structure of the governing bodies. A SEFI president has a 1-year mandate, the IGIP president has a practically unrestricted mandate. SEFI's decisions are taken by an administrative council rather than by the president assisted by a scientific council. I leave to you to ponder the more subtle differences between pedagogy (IGIP) and formation (SEFI). So we cater to the same clientele, and we have comparable profiles, but this does not mean that we cannot work together. Before dealing with specific common projects, let me mention the different documents SEFI produces. On a regular basis we publish a scientific journal, the *European Journal of Engineering Education* (EJEE) and a bulletin, the *SEFI News*, and the proceedings of our yearly conference. Special publications that treat special aspects of engineering education are published on an irregular basis, as the need arises.

CURRENT ACTIVITIES

Intensive co-operation of all three engineering organizations with universities in Eastern Europe in a changed political climate is essential. The magnitude of the problems is such that a duplication or a triplication cannot be allowed. IGIP profits from a privileged position with respect to these countries due to tradition and geographical expansion. FEANI's strength lies in the membership structure of the federation, where not individual institutions but national chapters are FEANI members. SEFI hopes to use its Brussels connection to launch this co-operation. The previous SEFI Secretary General is now an important TEMPUS personality and Prof. Lajos, who will present TEMPUS to this audience, is a member of SEFI's administrative council. I have to congratulate IGIP for the timely choice of Vienna as the venue of the 1990 Engineering Education Conference. Vienna has always been the barycentre of geographical Europe and it will retain its status as the centre of a unified political Europe. Moving the conference to Budapest for the last day also has deep symbolic meaning. In 1995 this same combination will be repeated during the World Exposition and possibly with the participation of SEFI. It is hoped that by that time the problems should be under control. To this purpose and to highlight the urgency of the questions we face in Eastern Europe I will propose to the Council of SEFI the creation of a Taskforce for Eastern Europe. This set-up will give the necessary flexibility for content, composition and working mechanisms. The Continuing Engineering Education Conference last December in Balatonfüred convinced me of the necessity for this creation and showed that enough people on both sides of the curtain are willing to work to make it a success. These developments in Eastern Europe should not eclipse the equally important problem of our co-operation with developing countries. The newest SEFI working group on Engineering Education and Developing Countries held its first seminar in May 1990 in Rome. Another working group to be created is on Environmental Engineering. I am confident that the General Assembly and the Administrative Council will follow these presidential proposals and will give the green light to these new and exciting activities of our society.

Other activities of SEFI are the participation in the European Technology Management Initiative (ETMI), where we are partner in a consortium together with the European Forum on Management Development (EFMD), Europace, and Jupiter. More directly, our co-operation with Europace, where SEFI was involved from the beginning, continues. We will then try to launch Eurascope, an advanced short courses programme. Another initiative is EUROPRO, which is attempting to create a professional development degree. A major project will be the creation of a service and information centre which stores all relevant information about initial and continuing engineering education in a database at the disposal of industry and professional organizations and institutions of higher learning. This project will be undertaken in close co-coperation with FEANI.

CONCLUSION

There is currently a very positive co-operation between the three European Engineering Societies, and we all have excellent relations with the American Society of Engineering Education. We are very active in promoting our engineering education through congresses, working groups and special initiatives. These positive developments are parallel with another, unfortunately negative development: the continuing degradation of the image of the engineering profession. We are pressured to increase the load of the engineering sciences curricula so that the already very demanding syllabus become even harder and longer. A young person faced with a choice between, for example, engineering and economics will choose the latter, because it is easier, shorter and also better paid. Ursprung in his paper gives some ideas of ways to upgrade the image of the technical sciences. This ongoing denigration of a profession which is largely blamed for the ecological decline of our environment is not helpful in a time when everybody cries for more engineers. But to put the blame for the insufficient number of engineering graduates on the universities is unacceptable. If, according to a recent census, only 48% of a class of engineers work in their field 10 years after graduation then it is obvious that it is not a lack of output at the university level but a problem of keeping a professional attracted to his field. An amelioration can only succeed by close partnership between universities, the industry and governments.

We have to enlarge the recruitment base for potential engineering students. This gives me an opportunity to mention another of our working groups, Women into Engineering. While chemistry always had a strong attraction for women, giving more precise information about other modern engineering sciences would make the field more attractive and remove existing misconceptions. A brochure, *Women in Engineering*, based on the 1988 Conference in Leuven, can be obtained from our secretariat in Brussels.

These last comments do not do justice to the importance of the problem of the image of the engineering profession. Nevertheless I think they need mentioning, if only to emphasize that a good formation, initial and continuing, is necessary, but does not solve all of the existing problems.