

Ten years of university education of fire protection engineers – how was it born?

According to the Universities Act, basic university education and training, in addition to knowledge and skill, shall provide the students with the capability for independent and critical evaluation, the capacity for independent problem-solving, and the ability to develop further knowledge, all within the field to which the education relates.

Education should also develop the student's capacity for information exchange at a scientific level. This type of objective brings together basic education and research as a necessary condition for fulfilling the objective and quality at an internationally high level for both forms of activity. Because long-term, internationally-respected fire research proved to be a major factor in locating this education programme at Lund University, it is natural for me, by way of introduction, to touch upon this extension process, in which I have been privileged to be involved for over 35 years.

When I first came into contact with fire engineering research and development at the end of the fifties, I was surprised that long-term research programmes, systematically planned and implemented large-scale research projects, and analytical approaches were fairly thin on the ground. In my youthful impetuosity, my first reaction was to create a general research programme for the definition and long-term development of an analytical method for a fire-engineering approach to the design of load bearing and partition structures, based on well-defined function requirements and evaluation criteria. The programme received the support of the Liaison Group of Inter-Scandinavian Building Research Conferences, and had a double aim: first, to facilitate systematic and integrated choice of research projects, and thus to be able to create a new design method practically applicable within a reasonable time, and second to initiate and stimulate collaborative Scandinavian fire research projects.

Unfortunately, it was not possible to realise the latter objective at that time. However, over the years, the programme became a significant instrument for a choice of integrated and mutually stimulated research projects for the fire-research group which was formed at LTH from about the mid-sixties, and which was the embryo of the advanced, internationally highly valued research which now takes place at the Department of Fire Safety Engineering with broad coverage in fire prevention and fire fighting, as well as in other areas of rescue

service, including consequence and risk analysis of major incidents, in physical planning, and in rescue service operation planning.

The international expansion of fire research has been enormous over recent decades in both volume and scientific level. This development has led to an increasing number of the components of the fire and rescue aspects of a single building or the whole of society becoming accessible through mathematical modelling, which in turn has initiated the development of function-based methods of fire and rescue service planning, design, and formulation.

The greatly increased potential for function-based design and formulation of the total rescue service and its systems and components forms a necessary condition for upgrading of fire protection engineer education to university level. The requirement for raising the competence level is motivated by society's increasing degree of complexity with, for example, rapidly growing use of high technology and a parallel strong increase in society's vulnerability and risk potential as critical background factors in the development of rescue services.

The increase in competence required applies to all professional groups working with advanced rescue service problems, including groups for which these problems are the main task (rescue chiefs and officers, fire protection engineers, fire consultants, people active in risk management), and others, such as architects and builders, whose role in this context is to integrate constructional fire protection as a functionally important component in a design, planning, and implementation process for a building or a community. The competences required cover wide areas of society – national and local rescue services, industry, consultancy companies, and insurance companies.

The university education programme of fire protection engineers, which began at Lund University in the autumn term of 1986, was then the only one of its type in Europe. Its origin lay in the extensive investigation work that had taken place over a large part of the seventies and the beginning of the eighties.

In 1973, the government engaged three experts to make a survey of the then current fire service training, based on the considerations of the Memorandum 'Training in the National Fire Prevention and Fire Fighting Colleges, etc' of 1962. A basic reason for this was that, from 1974, local authorities took over responsibility for the general rescue services, extending the local rescue service remit to include not only fires but dealing with oil-spills,

collapses, flooding, and other emergencies. The experts presented their proposals for improved training in the Report 'Rescue Service Education and Training', Ds KN 1979:5.

The proposal was revised by a government working group and a redeveloped proposal was presented in Memorandum 'Education and Training in Rescue Services, etc', Ds Kn 1981:24. After circulation for consideration by the parties concerned, the proposal reappeared as Proposition 1982/83:23 'Education and Training in Rescue Services, etc'. The proposition offered a solution for fire protection engineer education which lay close to that which began in the autumn term of 1986, and the arguments made by Lund University to the then head of the Ministry of Municipal Affairs for a location of the education programme to Lund convinced the government of its advantages thereof.

In autumn 1982, a new government took over, and through official communication 1982/83:72, revoked in November 1982 the proposition of the previous government. The main reason for this was the proposal for making firefighter training a technical college subject.

In June 1982, the then head of the Ministry for Municipal Affairs set up a committee, known as the CESAM committee, with the task of investigating the co-ordination of central management of rescue services in both peace and war situations. In February 1983, the government decided to widen the CESAM committee's remit to cover a continued review of education and training in general rescue services and of personnel in sweeping services. The review was to be carried out as an unbiased investigation within the framework of substantially unchanged resources for total education and training. For the purposes of this review, the CESAM committee formed a special working group which made its proposals in the form of a report 'Education and Training for Rescue Services and Sweeping Services', Ds Fö 1984:1, which is attached to the CESAM committee's outline report 'The National Rescue Services Agency', Ds Fö 1984:2, in March 1984. A revision of the outline and the report then led to government proposition 1984/85:161 'Management of Public Protection and Rescue Services, etc', approved by Parliament in June 1985.

The decision meant that an education programme of fire protection engineers consisting of 100 points (2.5 years) was introduced from 1 July 1986 at Lund University with an intake of 25 places per year. The decision also placed special emphasis that the increased requirement for scientific and technical knowledge on the personnel is met through the new education. For those intending to be fire chiefs, the decision also incorporated a requirement for a one-

year practical training course in addition to the fire protection engineer education. Responsibility for this extra training lay with the National Rescue Services Agency.

The fire protection engineer education as proposed in the report of the CESAM committee has a significantly higher level of ambition than that which began in autumn 1986. The CESAM committee had the opinion that society's current and future rescue services needed a four-year university-level education for fire protection engineers, based at a technical university, in other words, education of the same length as what was then current for the master of science programmes. The education was to involve 100 points instruction in general technical and fire engineering subjects, sandwiched with practical periods totalling 30 weeks. The final year, totalling 40 points, was to be differentiated into two study areas – one towards local authority administration/rescue services, and the other towards industrial/insurance/protection technology.

The actual programme that commenced in 1986 differed from the proposals of the CESAM committee mainly in the following respects:

- * The university part of the education, which alone leads to the fire protection engineer examination, is 40 points shorter than the corresponding part of the CESAM committee's proposal.
- * Those who undergo the one-year extension training also experience a shorter total education and training (approx one year) than the CESAM committee's proposal.
- * The CESAM committee proposed one principal for the total education and training (the university), but the that decided upon has two principals (the university for education at Lund and the National Rescue Services Agency for the one-year extension training at the Rescue College at Revinge).

In order to prepare for the new university education of fire protection engineers, an interim study programme committee was formed from 1 July 1985, followed a year later by a regular study programme committee with responsibility for the continued build-up and organisation of the education. The interim committee was already well aware that the reduction in education training, which for cost reasons had been made vis-à-vis the CESAM committee's proposal, would create difficulties in reaching the objectives of the education required by public rescue services. The requirement for an extension of the education was therefore put forward in the study programme committee's first appropriation presentation, and a result of

following this up led nine years later to an extension of the higher education unit from 100 to 140 points, starting from academic year 1994-95. The support this presentation received during the concluding phase of its treatment via reports from the National Board of Housing, Building and Planning, the Swedish Association of Local Authorities, and the National Rescue Services Agency, proved to be of very great significance in obtaining government and parliamentary approval.

The planning, formulation, and implementation of Sweden's only – and Europe's first – university education programme for fire protection engineers, despite the difficult initial situation, has been a great success, and of major international significance, due to the excellent co-operation of many internal and external colleagues. Most of all, it has been due to a special person, Robert Jönsson, who in his capacities of Director of Studies and Head of Department, through his leading role and his enormously broad and skilled efforts during the build-up process, was totally decisive for the success of the education programme.

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