

“European Lighting Expert” – the European standard for knowledge in lighting

Matthias Hessling
President
European Lighting Expert Association (ELEA)
Olten, Switzerland
matthias.hessling@swarco.com

Abstract — Due to the increased pace of technological developments in lighting, requirements for know-how are becoming more complex, and customers have to rely on so-called “experts” for their conceptual design, planning and operational needs. A common standard, however, to define and measure the level of know-how, such “experts” should have, did not exist so far. For that reason, the lighting societies of Germany (LiTG), Austria (LTG), the Netherlands (NSVV) and Switzerland (SLG) created such an educational standard. A “European Lighting Expert” has to prove his/her competencies in an examination, testing sufficient know how related to a wide-ranging catalogue of topics, and being supervised by an independent body. After an examination on national level, successful candidates are eligible to be registered as European Lighting Expert by the “European Lighting Expert Association”, which was founded in August 2016 and it is open for membership by lighting societies from other European countries.

Index Terms — educational standard, European standard, examination, know-how, lighting expert

I. BACKGROUND

Due to the increased pace of technological developments in lighting, requirements for know-how are becoming more complex, and customers have to rely on so-called experts for their conceptual design, planning and operational needs. A common standard, however, to define and measure the level of know-how, such “experts” should have, did not exist so far. While there are specific, lighting related examinations possible at universities on a top level, those who focused on practical planning, product sales or operational tasks, and did not choose the comprehensive, but time consuming university education, an internationally accepted education and examination was missing, allowing them to prove their know how.

While there are many training programmes being offered, and well sounding titles being available after short training already, it is difficult to judge their quality. This is even more so, if a title was acquired in a foreign country and is not known in others. Moreover, some training courses are offered by manufacturers or developers of luminaires, systems or software programmes, and while they might be of sufficient quality, they might also lack the independence required to develop the optimal solution for the customer e.g. in conceptual and planning tasks.

Against this background, there is a need for an independent and transparent qualification, examination and a related title, guaranteeing that the candidate has a defined level of competencies, regardless where in Europe the examination to acquire this title has taken place.

II. DEVELOPMENT OF THE “EUROPEAN LIGHTING EXPERT” CONCEPT

Based on above analysis, the lighting societies of Germany (Deutsche Lichttechnische Gesellschaft, LiTG), Austria (Lichttechnische Gesellschaft Österreichs, LTG), the Netherlands (Nederlandse Stichting voor Verlichtingskunde, NSVV) and Switzerland (Schweizer Licht Gesellschaft, SLG) few years ago started a project to create such an educational standard. Until autumn 2016, they had finished a process of thorough consultation, to define exactly the requirements to pass the examination as “European Lighting Expert (ELE)”, and to fix all details about the standard and execution of the examination, its independent supervision by a special body, as well as the administration of this title.

In addition to the basic requirements mentioned above, such as independence, transparency and clearly defined competencies, the lighting societies worked out the following principles:

- publication of a catalogue of educational objectives, defining the required competencies of a European Lighting Expert
- differentiation of required competencies in different levels per topic (according to Bloom’s taxonomy)
- differentiation between interior and exterior lighting in the examination and in the acquired title
- national examination to be carried out under responsibility of national lighting societies

- compulsory oral examination, in order to evaluate the candidate's ability to apply the acquired knowledge, optionally with an additional written part
- homework (specific planning task) to be presented in the examination
- independent supervision of the examination
- training for such examination not compulsory and not restricted to offers from national lighting societies (can be offered by other institutions too)
- registration as European Lighting Expert requiring such national examination, as well the compliance with a specific code of conduct
- publication of the register of European Lighting Experts in a specific website
- re-registration after 5 years, requiring proof of sufficient further education (e.g. by conference participation)
- administration of the examination's supervision, the registration, the register and the further development of the concept and all corresponding documents by a specific association, the "European Lighting Expert Association (ELEA)"

III. TARGET AUDIENCE

The target audience of the "European Lighting Expert" concept consists of persons interested to qualify as experts in indoor and/or outdoor lighting, such as:

- employees and entrepreneurs of all business areas of the lighting branch (technology, planning, design, installation, facility management, marketing & sales, operations etc.)
- newcomers in lighting with a solid education in a different field (e.g. electricians, wholesalers, energy consultants, auditors etc.)
- people involved in lighting technology and design looking for further education (e.g. architects, engineers, planners, builders, employees in technical offices, testing/certification institutes etc.)

Persons intending to be registered need profound knowledge about relations between perception, generation and effects of light as well as the related electrical engineering. They have to be able to apply this knowledge considering the relevant laws, standards and rules as well as ecological and economical aspects. They need to know up-to-date lighting equipment and lighting controls and how to use them. Proficiency about interfaces to adjacent fields like architecture, electrical engineering, ergonomics and ecology is mandatory. This enhances the ability to recognise lighting as being multidisciplinary and embedded in the environment.

The capability to think discretely and conceptualise interdisciplinary is essential to take proper decisions and act conveniently. Candidates who have passed an examination enabling their registration as European Lighting Expert are qualified to independently work in the fields of surveying, analysing, planning, designing, consulting, selling, installing and operating lighting installations in indoor or outdoor environments.

IV. DEFINITION OF REQUIRED COMPETENCIES

It is not sufficient to only repeat memorized knowledge to succeed in an examination qualifying for the European Lighting Expert in indoor or outdoor lighting. The educational objectives must be worked out by individual thinking and studying to achieve the necessary level of competence.

The educational objectives are classified into three levels of competence (after Bloom's taxonomy), which are necessary for the qualification as European Lighting Expert, with increasing difficulty:

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| C1: Knowledge | Exhibit memory of learned materials by recalling facts, terms, basic concepts, and answers: <ul style="list-style-type: none"> • knowledge of specifics – terminology, specific facts used in lighting • knowledge of ways and means of dealing with specifics – conventions, trends and sequences, classifications and categories, criteria, methodology • knowledge of the universals and abstractions in lighting – principles and generalizations, theories and structures |
| C2: Comprehension | Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating the main ideas. Coping with issues and problems in lighting praxis with calculations, graphical presentations and explanations. |

C3: Application Using acquired knowledge. Solve problems in new situations by applying acquired knowledge, facts, techniques and rules in an unknown and new situation. Coping with complex problems as found in typical working routines, finding optimal solutions.

V. EXECUTION OF THE EXAMINATION

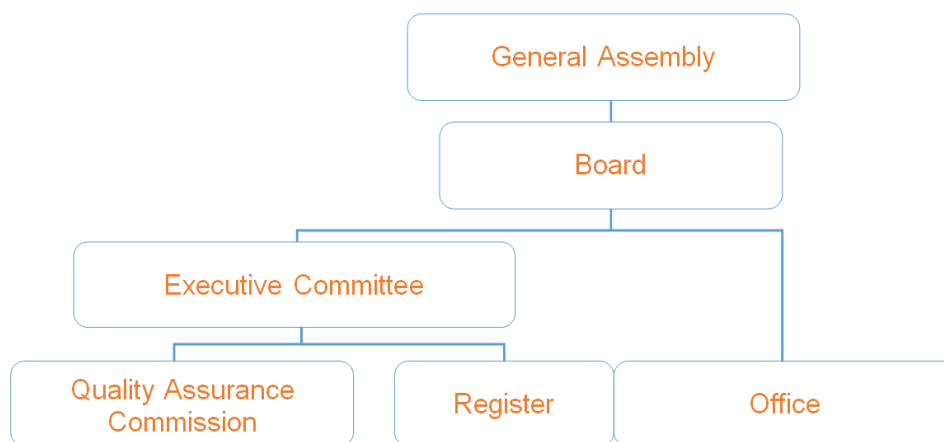
In the examination, the candidate has to prove sufficient know how related to a wide-ranging catalogue of topics from basic knowledge in lighting technology, electrical engineering, light sources and luminaires, via lighting design, execution, operation and renovation of exterior and/or interior lighting to photometric measurements. There is a total of some 150 sub-topics, each one of which requiring a different, specific level of knowledge, understanding and ability to apply the acquired knowledge (C1 to C3, as described above), and differentiated between exterior and interior lighting. In addition to a compulsory oral examination and possibly a written part, the examination contains the presentation and discussion of a planning task, which the candidates have worked on prior to the examination. This approach allows to test candidates according to the defined educational objectives with a differentiated level of competencies up to C3 (ability to apply acquired knowledge), which would be impossible – or at least very difficult – with a written test, or even a multiple-choice test only.

The examination can be done under responsibility of any of the national member societies of the “European Lighting Expert Association (ELEA)”. In several countries, corresponding training is provided by the lighting societies. For the examination, however, the participation in these training courses is not mandatory. Also, any voluntary preparatory courses may be provided by other institutions as well. After an examination on national level, successful candidates are eligible to be registered as European Lighting Experts by the ELEA.

VI. ADMINISTRATION OF THE “EUROPEAN LIGHTING EXPERT” CONCEPT

The ELEA was founded in August 2016 by its four founding members LiTG, LTG, NSVV and SLG, and it is open for membership by additional lighting societies from other European countries, who are invited to realize the ELE concept in their respective countries. The ELEA is responsible for all documents related to the educational concept and its further development, for the independent supervision of the examinations, the registration, the certificates, the register itself, the publication of that register in a specific website (www.europeanlightingexpert.org), as well as all administrative tasks within the association with its growing number of members.

The organizational structure of the ELEA looks as follows:



The ELEA is a society registered in Switzerland. Its office is located in Olten (Switzerland), where also the register is managed. Office and register are run by the Schweizer Licht Gesellschaft (SLG). Each of the current members of the ELEA is represented in the Board – with Matthias Hessling (LiTG) as President, Jan Meutzner (NSVV) and Manfred Mörth (LTG) as Vice Presidents and Albert Studerus (SLG) as Treasurer and Secretary – in the Executive Committee, which is responsible for the operative tasks, and in the Quality Assurance Committee, the independent body, not bound by instructions from other ELEA bodies, controlling the compliance with the examination regulations and the defined educational objectives in the national examinations.

Candidates who have passed a national examination and have committed themselves to comply with a particular code of conduct, can apply via their national lighting society for a registration as European Lighting Expert. In addition, they have to pay a registration fee, which currently amounts to 150 €. For member associations of the ELEA, there is a yearly membership fee to be paid. In addition, national lighting associations from other countries are asked for a one-time admission fee, which should be regarded as contribution towards the costs associated with the preparation of the ELE concept by the four founding members.

VII. OUTLOOK

The ELEA is happy that several parties already have expressed their strong interest to join the association, and invites all others to ask for any information they might need. By the end of May 2017, 24 European Lighting Experts already were registered by the ELEA, and the ongoing training courses, examinations and applications for a registration from several countries – an additional 25 in the next round – will lead to a constantly growing number.

Customers and companies working together with European Lighting Experts can be sure to have partners with a comprehensive and clearly defined level of lighting know how, and for European Lighting Experts, it has become much easier to prove their competencies, to be recognized in an international context, and to get easier access to attractive lighting jobs.

Responses from registered European Lighting Experts are very positive and promising – it seems that the concept is well balanced and does satisfy existing needs, and that it did come at the right time with its enormous developing speed and customers increasingly relying on qualified support. A European Lighting Expert for sure can provide this!