

ASSOCIATION OF LASER SAFETY PROFESSIONALS

MEMBERSHIP CRITERIA

1 Membership of the Association

The Association of Laser Safety Professionals is a member-based organisation whose members have satisfied the Membership Criteria defined in this document. Those accepted for membership of the Association are deemed to have also met the minimum requirements necessary to act as a Laser Protection Adviser, and are Certificated as such by the Association. Laser Protection Adviser Certification is awarded by the Association in two categories, (i) medical and cosmetic laser safety and (ii) non-medical laser safety, depending on the area or areas in which individual members have demonstrated their experience and competence.

2 The assessment process

Those wishing to be considered for membership of the Association and certification as a Laser Protection Adviser must apply in writing to the Membership Secretary and must submit a completed application form and curriculum vitae. The curriculum vitae should substantiate the candidate's claim, made on the application form, to possess substantial experience and competence in laser safety. Some supporting documentation may also be helpful, such as hazard analyses, risk assessments or safety policies (e.g. local rules) that the candidate has written, but this is not essential and substantial documentation is certainly not required. (The Association places greater emphasis on evaluating a candidate's understanding by means of an interview, as described below, rather than on the submission of prepared written material.)

The assessment of membership applications is carried out in two stages. Both stages are conducted by Assessors appointed by the Association. The first stage covers a review of the candidate's submitted application, to ensure that the experience claimed by the candidate appears to be adequate and appropriate to justify further consideration for membership. The second stage involves an interview, during which the candidate's background and experience will be discussed in more detail and their knowledge and understanding of laser safety explored in greater depth.

The aim of this two-stage assessment process is to establish whether or not the candidate has -

- extensive, and continuing, experience of and involvement in laser safety;
- substantial understanding of, and competence in, laser safety;

- a professional attitude and approach to laser safety.

These define the **three basic requirements** necessary for membership of the Association and for certification by the Association as a Laser Protection Adviser.

In the case of candidates who are applying for certification in medical and cosmetic applications, appropriate understanding and experience of intense pulsed light (IPL) sources would also be relevant, and where the word 'laser' is used in this document it can, where appropriate, be understood to include IPL *in addition* to laser.

3 The criteria for membership

Detailed criteria have been established by the Association to assist candidates for membership and the Association's Assessors in interpreting the **three basic requirements** defined above. These are set out below.

a) Extensive, and continuing, experience of and involvement in laser safety.

This requirement will be met if the candidate can satisfy the following conditions.

The candidate has been professionally and actively involved in laser safety, directly in the application area or areas in which they are seeking certification (i.e. the medical & cosmetic area and/or the non-medical area) for at least the previous two years. (Shorter periods may be sufficient if the involvement has been particularly intensive and if the candidate's technical background is especially relevant.)

The candidate has, during this period of involvement, been substantially involved in laser safety (typically averaging at least 20% of their working time, or considerably more if their relevant experience in laser safety is less than two years).

The candidate has been active in laser safety at a reasonably high level, that is, by undertaking quantitative assessments (e.g. product classification or exposure evaluation), by being engaged in risk assessment activity, and by advising widely on safety control procedures involving engineering controls, procedural (administrative) controls and eye (and possibly other forms of personal) protection.

The candidate has wide practical experience of laser safety involving different types of laser systems and different kinds of environments (even though this experience may have been gained entirely within one application sector or with one employer, e.g. healthcare, telecommunications, display lasers or industry).

b) Substantial understanding of, and competence in, laser safety.

This requirement will be met if the candidate has sufficient overall awareness of each of the following ten topic areas and can demonstrate a good, detailed level of understanding in at least five of them, and has the ability to apply this knowledge competently.

i) *Legislative framework*

- *General knowledge of health & safety legislation (e.g. the Health & Safety at Work Act and particularly the Management of Health & Safety at Work Regulations and the PPE at Work Regulations).*
- *The legal roles and responsibilities of the employer and employees.*
- *Awareness of agencies such as HSE and HPA (and, for those seeking medical & cosmetic LPA certification, the Healthcare Commission) and their roles and responsibilities in laser safety matters.*
- *Awareness and general scope of relevant EU Directives (e.g. Low Voltage Directive, Machinery Directive, Physical Agents (optical radiation) Directive).*

ii) *Safety standards and guidelines*

- *The existence and role of ICNIRP in determining optical exposure limits.*
- *An awareness of the main national & international standards bodies (BSI, CEN, CENELEC, IEC & ISO), their roles and their involvement in developing laser-safety related standards and guidelines.*
- *Knowledge of the scope and general contents of key safety standards and technical reports relevant to laser safety, e.g. – BS EN 60825-1 and PD IEC TR 60825-14.*
- *General awareness of the whole 60825 series of documents (although not necessarily the ability to recite the complete list).*
- *Detailed familiarity with the particular standards and guidelines that are related specifically to the candidate's own work in laser safety, e.g. –*

For medical & cosmetic applications:

DB 9602 (MRHA guidelines)

National Minimum Standards P1, P2 and P3

BS EN 60601-2-22

For industrial (i.e. materials processing) applications:

BS EN 60825-4

ISO 11553-1

For applications in optical telecommunications:

BS EN 60825-2

BS EN 60825-12

For display lasers:

HS(G)95

iii) Laser hazards and bioeffects

- *General effects of optical radiation on the body.*
- *Types of laser-beam interactions with human tissue.*
- *Basic anatomy and optics of the eye; effects on the eye of laser radiation at different wavelengths; focusing effects on the retina.*
- *Basic structure of the skin; effects of laser radiation on the skin.*
- *Ancillary hazards (e.g. electrical, fume, fire, gas, chemical hazards, etc.)*

Note: In medical & cosmetic applications the understanding of laser-tissue interactions should cover not just hazardous effects (i.e. the consequences of accidental, unintended exposure) but also intended therapeutic effects.

iv) Basic optical physics

- *Types of lasers and the basic principles of their operation.*
- *Basic optical phenomena (reflection, scattering, absorption, transmission, refraction, diffraction).*
- *Simple geometric optics (the effect of lenses, prisms and mirrors).*
- *Meaning of terms such as refractive index, focal length, spectral quantities (e.g. spectral transmission).*
- *The basic design and operation of simple optical instruments (e.g. eye loupes, microscopes, binoculars, telescopes).*
- *Basic construction and use of optical fibres (including meaning of numerical aperture and mode-field diameter).*

v) Product classification

- *The system of product classification defined in BS EN 60825-1, and the essential meaning of each class.*
- *The accessible emission limit (AEL) – what it is and how it's used.*
- *The basis of the measurement criteria for classification (although not necessarily the detailed measurement geometry) and the rationale of the three measurement conditions.*
- *Awareness of the previous IEC classification scheme and also of the CDRH classification scheme, and the essential differences and similarities between these and the current IEC scheme.*

vi) Product safety requirements

- *Awareness of the manufacturing requirements for laser products, (although not necessarily knowing the complete and detailed list of requirements for each class).*
- *The concepts of operation, maintenance and service, and the relevance of these to classification.*

- *Basic knowledge of the labelling requirements (but not necessarily the exact wording), and the ability to recognise the differences between IEC and CDRH labels.*

vii) *Emission & exposure evaluation*

- *Basic radiation parameters, and conversion between power and energy units.*
- *The time bases used for classification.*
- *The choice of a suitable time base for the MPE.*
- *Using the various wavelength/time/source-size correction factors for determining the AEL and MPE.*
- *Understanding beam diameter, beam divergence and the size and location of the apparent source.*
- *Basic awareness of how laser beams propagate (e.g. near-field and far-field effects), and of typical beam profiles.*
- *Evaluating levels of exposure to laser radiation and comparing these values with the MPE.*
- *Dealing with pulsed emission.*
- *NOHD, ENOHD, and how these values are determined (i.e. the process, not necessarily the formula).*
- *Types and use of radiation measurement equipment; methods of calibration; dealing with measurement uncertainties.*

viii) *Risk assessment*

- *Concepts of hazard and risk.*
- *The purpose and process of risk assessment.*
- *Undertaking practical risk assessments.*

ix) *Control procedures and management policies*

- *The importance of the hierarchy of control measures.*
- *Use of the outcome of a risk assessment to determine the appropriate control measures.*
- *Engineering controls, administrative & procedural controls, use of personal protection (see also topic 10).*
- *Safety policies and local rules.*
- *Setting up laser controlled areas.*
- *Laser safety training (who needs to know what, structuring courses, etc).*
- *The role and responsibilities of the LPA, LSO/LPS, laser operators, etc.*
- *Managing laser safety in the workplace; reporting and record keeping.*
- *Response to incidents and accidents.*

x) Eye protection

- *Rationale for using eye protection.*
- *Eye protection standards EN 207 & 208, and the meaning of the scale numbers (i.e. L and R numbers) used in these standards.*
- *How eye protection should be specified in given circumstances.*
- *Policies for the use of eye protection.*

c) A professional attitude and approach to laser safety.

The requirement will be met if the candidate can satisfy the following conditions.

The candidate is able to discuss and explain issues in a clear and confident manner.

The candidate applies a logical and systematic approach to the analysis of situations and problems.

The candidate has an awareness of the professional standards and ethics inherent in the adviser-client relationship.

The candidate has a genuine interest in belonging to a professional Association dedicated to matters of laser safety and in contributing wherever possible to the development of laser safety.

4 Conclusion

Candidates for membership must submit the appropriate fees prior to each stage of the assessment process, and if successful must then pay the requisite membership fee before they can be admitted to membership. Membership of the Association is renewable on an annual basis. Certification as a Laser Protection Adviser is valid for five years (provided that the person remains a member of the Association throughout this period) and must then be renewed.

Candidates who have their application for membership rejected at either the first or second stage of the assessment process and who have reasonable grounds for believing that they satisfy the membership criteria have the right for their application to be reviewed by the Committee of the Association. In this event, the Committee's decision will be final.