



LASER SAFETY COURSE

Course Content

1 Hazard and Risk

Definition of the terms “hazard “ and “risk”. This is required as background to subsequent sections.

2 Laser Classification - the laser hazard.

Description of the laser classes. What they mean in terms of hazard. Assumptions made when classifying lasers - the “worst reasonably foreseeable event”). What the classification signs look like and what they say. What precautions should be taken.

Changes to the laser classification system under the 2001 amendment to EN 60825-1. Comparison of new system with the old one.

3 The human eye.

Brief description of the anatomy of the human eye. Definition of the optical spectrum. Response of the eye to optical radiation. Which tissues are affected by which wavelengths. The warning signs (visual, pain,) or the lack of them. The model of the human eye used in laser safety.

4 Assessing the risk of damage from laser light.

Risk assessment. How likely is it that the laser hazard (which is known through classification) will lead to injury. “ Maximum Permissible Exposures” how they are determined, what they mean. Distinction between collimated and divergent beams - the concept of “Nominal Ocular Hazard Distance” and its significance. When does a “dangerous laser” present no risk. Extended sources, how they are defined and the effect on the “maximum permissible exposure” (MPE).

5 Biological damage from laser light.

The damage mechanisms - photochemical - thermal as a function of wavelength. Differences between photochemical and thermal hazards. The effects of over exposure to laser radiation - to the retina, to the cornea, to skin as a function of wavelength and the resultant physical symptoms.

6 User Precautions

- a) Recommendations of EN 60825-1 for user precautions - the hazard based approach.
- b) A risk assessment - based approach.

7 Principles of Laser Safety Calculations

Calculation of AEL's, MPE's, NOHD, ENOHD, Classification etc

8 Requirements for switches and interlocks

Satisfying the HSE inspector. Meeting the requirements of the machinery directive.

9 Protective eyewear

When it should be used. What eyewear is required. How to specify. Understanding EN 207.

10 Duties of the laser safety officer

A summary of the LSO's duties and responsibilities. What the LSO is required to know.

11 Reporting Procedures

The need to report a possible laser accident immediately and the need for a rapid response. Why this is a legal, not a medical requirement.

12 Laser Safety - The Company and the Individual

Safety is the joint responsibility of the Company and of its employees. The actions which should be undertaken by each party to ensure a safe environment (a laser safety programme) will be described.

13 EN 60825-2 - Fibre Optic Laser Communication Systems

Outlining the special case of fibre optic systems and the requirements under the standard. Also including the expected changes coming about from the revision in EN 60825-1

14 EN 60825-1 Amendment 2 : 2001

An outline of the major differences between the 'old' and 'new' standards created by this major 70 page amendment.