

Definitions

Accessible Emission Limit (AEL)

- The maximum total power of radiation that can be emitted from a laser of a particular class.

Maximum Permissible Exposure (MPE)

- The minimum irradiance or radiant exposure that may be incident upon the eye (or skin) without causing biological damage.
- The MPE is related to the AEL by the limiting aperture of the eye (function of wavelength and exposure time)

Nominal Hazard Zone (NHZ)

- The distance within which the irradiance of a beam is greater than the MPE.
 - Is specific to the wavelength and exposure time
- NHZ is different for the 3 possible paths to the eye:
 - Direct Viewing
 - Specular Reflectance
 - Diffuse Reflectance

Method For Evaluating Laser Safety

1. Calculate the maximum irradiance that an unprotected eye might experience while the system is operating in a particular manner.
 - Optical alignment
 - Changing optics
2. Check if #1 is less than the MPE.
3. Calculate the NHZ for each of the operating scenarios.
4. For each NHZ, calculate the OD for laser safety goggles needed to reduce the irradiance at the eye to be below the MPE.