**TC76/Sec73**

# BUSINESS PLAN

| CENELEC/TC or SC<br>76 | Secretariat<br>Germany | 2012-08-09 |
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| **TC title:** OPTICAL RADIATION SAFETY AND LASER EQUIPMENT | | |

## A Background

Scope:

To prepare international standards for equipment (including systems) incorporating lasers (and light emitting diodes) or intended only for use with lasers, including those factors introduced by the use of lasers which are needed to characterize equipment and/or which are essential to safe use. The scope includes the preparation of standards applying limits as determined by organizations such as ICNIRP and CIE, to human exposure to optical radiation (100 nm to 1 mm) from artificial sources.

## B Business Environment

### B.1 General

TC 76 is working in the domain of laser, LED and other optical radiation safety of equipment and is recognized as the leading body on laser standardization in this technical area. It also provides guidance to other TCs preparing vertical standards for products containing optical radiation sources. With the growth in interest the need for standardization has accelerated. It is anticipated that laser technology will continue its rapid growth as a number of application fields are growing in society. Areas where laser radiation sources will play a major role are the following: surgical and medical therapeutic and diagnostic means, including cosmetic uses; materials processing in industry; optical communications, general and local networks; office machines; measurement systems for use in a variety of environments; laser light shows and displays and full colour TV LED and laser displays; and consumer equipment such as CD/DVD players/recorders and home improvement aids.

These trends imply a growth of widely different laser devices ranging from high power lasers for industrial, medical, and research applications to low power laser components for information technology type applications. Particularly noticeable is the increase in numbers of semiconductor lasers, which constitute inexpensive components for a wide variety of applications such as sensors, measuring devices, and optical transmitters. The laser radiation used in these applications is in many cases transmitted through optical fibres. In addition to these mostly low power semiconductor laser applications, there is an increasing practice to transmit high power laser radiation through optical fibres. Such is the case with regard to the use of Nd:YAG lasers in medical and cosmetic applications as well as in materials processing. In the latter field the availability of high power multi kW diodes and arrays, and the increased use of robots present particular safety problems. Additionally there is an increased use in the transmission of IR radiation in "free space." Such is the case in communications between computers, modems, etc., both within the same room as well as inter-building transmissions. There is also an increasing use of military laser devices and systems, e.g. for targeting, reconnaissance, and optical radiation weapons. The increase in terrorism can lead to the use of additional laser devices. Some possibilities are intercepting missiles and enhanced security detection systems. A very recent safety concern has arisen with the general public’s (especially children’s) ability to obtain laser pens/pointers. The use of lasers in the chemical processing industry is another growth candidate. Laser technology is continuing to develop with traditional large and energy inefficient laser equipment being replaced with physically smaller devices delivering high laser powers, usually at lower cost. This is providing opportunities for lasers to be used in a wide range of new applications and also for laser technology to transfer from the workplace to the home.

Non-laser optical sources and their applications are also developing at a rapid pace. These include the use of LED arrays to replace incandescent and fluorescent lighting, and the use of multi-coloured LEDs in public displays, such as sports scoreboards. Application of incoherent intense pulsed light sources (IPLS) on humans is increasing, causing hazards which are similar to those of the laser. Other non-laser optical sources continue to develop and employers are increasingly required to assess the risk to their workers and others. By providing standards and guidance for manufacturers of these devices it will reduce the need for practical assessments to be carried out by users. The standards developed by TC 76 not only respond to workplace needs, but also to the safety of the general public as innovative sources of light and other optical radiation proliferate.

## B.2 Market demand

Standards and technical reports developed by TC 76 are used by many groups, e.g. by:
Manufacturers of Laser and Non-Laser Optical Products, Users of Laser and Non-Laser Optical Products. Third Party Conformance Assessment Certifiers, Health & Safety Organizations, including Government Agencies. Laser and General Safety Consultants.

## B.3 Trends in technology

All the different types of laser sources and applications require a need for basic and product safety standards. In addition to developing standards covering the basics of safety with laser equipment, TC 76 is also working on the safe use of lasers in various fields of applications, e.g., medicine and cosmetic. The Committee also deals with some aspects of radiation safety as pertaining to the public, e.g., laser light shows and displays. Of considerable importance in this regard is the potential for visual impairment of airline pilots, vehicular operators, etc. An important task is to develop and recommend measurement methods necessary for the application of the laser safety requirements for classification and consideration of permissible radiation exposures.

The need has arisen for the development of similar safety requirements for products that involve non-laser sources of radiation in the optical spectrum. The first activity in this area was to include light emitting diodes (LEDs) in the scope of TC 76. This was because some LEDs could be used interchangeably with laser diodes in some applications where the potential hazards may be equivalent for the same power and wavelength, regardless of the origin of the optical radiation. Because the treatment of LEDs as lasers resulted in exaggerated classification of their hazards, TC 76 published IEC 62471 (EN 62471) as a joint IEC/CIE standard that more appropriately addresses LEDs in most applications. Another activity in this area is to establish a standard for intense lights used to expose humans or animals to produce a photobiological effect for medical or cosmetic purpose, and to prescribe risk-based engineering and informational controls. It was also recognised that the expertise within TC 76 may be of value to vertical committees producing standards for products containing other non-laser optical radiation sources. A technical report providing guidance has now been published as IEC 62471-2 (EN 62471-2). As the world hastens to develop more electrically efficient sources of lighting, the importance of the TC 76 standards and guides grows.

## B.4 Market trends

As described in B.1 to B.3.

## B.5 Ecological environment

Laser and LED products are continuing to make a considerable impact on environmental issues. The development of email and Internet communications, which are having a growing effect on commercial activities ("paperless society", "virtual conferencing", etc.) have only become possible because of the introduction of optical fibre technology using first LEDs, then lasers and developing to wave division multiplexing (WDM) and more recently dense wave division multiplexing (DWDM). New laser based technologies for IT and telecommunications purposes are expected to continue to be developed for some years. These developments have the potential to greatly reduce atmospheric pollution (reduced use of transport) and destruction of the environment (less use of paper).

Light emitting diodes are being increasingly used as light sources (traffic lights, airport beacons, indicator lamps, etc.) and it is anticipated that they will shortly replace incandescent lamps for premises. The greatly increased energy efficiency of LEDs over incandescent lights can therefore be expected to significantly reduce requirements for electric power generation.

### B.6 Involvement of societal stakeholders

From time to time, active participation in TC 76.

### B.7 Involvement of SMEs

From time to time, active participation in TC 76.

## C System approach aspects

Basic safety requirements developed by TC 76 are widely used for the development of standards by other committees.

## D Objectives and strategies (3 to 5 years)

More effective liaisons with other technical committees having responsibilities for standards for products incorporating optical radiation sources.

## E Action plan

Continuous follow-up of the activities in IEC/TC 76 and implementation of the standards developed by IEC in Europe after positive parallel vote.

## F Useful links to CENELEC web site

http://www.cenelec.eu/dyn/www/f?p=104:7:1917761483058185::::FSP_ORG_ID:71

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