STRATEGIC POLICY STATEMENT

IEC/TC or SC	Secretariat	Date
76	USA	2008-03-11

Please ensure this form is annexed to the Report to the Committee of Action if it has been prepared during a meeting, or sent to the Central Office promptly after its contents have been agreed by the committee.

Title of TC
OPTICAL RADIATION SAFETY AND LASER EQUIPMENT

A. Background

First Meeting: June 1974

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.

Responsibilities:
Safety Group Function for "Aspects pertaining to human safety relating to the use of lasers"

Current Working Groups:
WG 1 Optical Radiation Safety
WG 3 Laser Radiation Measurements
WG 4 Medical Laser Equipment
WG 5 Safety of Fibre Optics Communications Systems
WG 7 High Power Lasers
WG 8 Development and Maintenance of Basic Standards
WG 9 Non Coherent Sources
WG 10 Safety of Lasers and Laser Equipment in an Industrial materials Processing Environment

Number of Publications: 15

Number of projects in development: Maintenance work: 2, genuine new work: 4

Liaisons:

TC 34	Lamps and related equipment
SC 34A	Lamps
SC 47E	Discrete Semiconductor Devices
SC 62A	Common Aspects of Electrical Equipment used in Medical Practice
TC 66	Safety of Measuring, Control, and Laboratory Equipment
TC 86	Fibre optics
SC 86A	Fibres and cables
SC 86B	Fibre optic interconnecting devices and passive components
SC 86C	Fibre optic systems and active devices
TC 100	Audio, Video and Multimedia Systems and Equipment
TC 108	Safety of Electronic Equipment within the field of Audio/Video, Information Technology and Communication Technology
ISO/TC 172/SC 9	Electrooptical Systems
CIE	International Commission on Illumination
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ITU-T	ITU Telecommunication Standardization Sector

List of P-Members:
Australia, Austria, Canada, China, Czech Republic, Finland, Germany, Italy, Japan, Korea (Rep. of), Netherlands, Portugal, Romania, Russian Federation, Spain, Sweden, Switzerland, Thailand, United Kingdom, United States of America
Total: 20

System Approach:

Component committees (IEC TC 76 as customer)	IEC TC 1: Terminology IEC SC 17B: Low-voltage switchgear and controlgear IEC SC 65A: System aspects IEC TC 66: Safety of measuring, control and laboratory equipment
System committees (IEC TC 76 as supplier)	IEC TC 18: Electrical installation of ships and of mobile and fixed offshore units IEC TC 31: Equipment for explosive atmospheres IEC TC 44: Safety of machinery – Electrotechnical aspects IEC TC 61: Safety of household and similar electrical appliances SC 62A: Common aspects of electrical equipment used in medical practice IEC TC 66: Safety of measuring, control and laboratory equipment IEC TC 86 and SCs: Fibre optics IEC TC 95: Measuring relays and protection equipment IEC TC 100: Audio, video and multimedia systems and equipment ISO/IEC JTC 1/SC 25: Interconnection of information technology equipment

B. Environment

B.1 Business environment

Historically, TC 76 has been working in the domain of laser and LED 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 shown by individual nations and nations with unified interest like the European Community, the need for standardization has accelerated. This is especially true in the field of lasers, and as a consequence a number of standardization bodies are now involved. This calls for a continued revision of our activities, which includes coordination and close cooperation with a number of other committees, as well as unification of work at various levels within the standardization organizations. 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

Customers of standards and reports developed:

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
Other ISO/IEC Technical Committees

Representatives from these groups, which provide complete coverage of interested and affected parties, are active participants. These parties are very willing participants, except for the occasional funding problems that arise. The IEC standards are widely used at all levels, albeit somewhat modified to conform to local conditions. Recently our base standard has experienced a number of revisions. This lack of stability has limited the use of this standard to some extent. TC 76 recognizes this problem and is addressing it. Since laser and solid-state non-laser technologies are still emerging there are occasional problems with other standard organizations regarding the delineation of responsibilities. These are being handled satisfactorily through liaison. The delineation of responsibilities for specific product vertical standards are the most difficult to resolve.

B.3 Trends in technology and trade

All these different types of laser sources and applications require a need for basic and product safety standards. This is reflected in the tasks given to the Committee with the assignment of a Safety Group Function for "Aspects pertaining to human safety relating to the use of lasers and products containing non-laser optical radiation sources." 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 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 is in preparation.

B.4 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.

C. Work programme

Current work

Publish 60825-1 Corrigendum by February, 29, 2008. Circulate CDC for Information Sheet by Feb 29 2008. Submit ISH by June 30, 2008. Review if new biological research would impact potential changes in MPEs and AELs.

Circulate CD on Amendment to 60825-13 by March 31, 2008. At Beijing Review NC comments on CD, and begin work on next appropriate document

Circulate CDC on 60601-2-57 by March 31, 2008. Continue review of comments on 76/365/CD. At Beijing review NC comments on CDC on 60601-2-57, and initiate work on next appropriate document Begin preparation of next appropriate document for 60825-16.

Circulate a CD on the next amendment of 60825-2 (to take account of changes in the basic requirements of 60825-1 Edition 3), by February 29, 2008. Circulate a CD on 60825-17 to take account of changes in the basic requirements of 60825-1 Edition 3, by March 15, 2008. Review 60825-12 to determine what changes are necessary to take account of changes in the basic requirements of 60825-1 Edition 3. At Beijing, review NC comments on CDC on 60825-2 amendment, and initiate work on next appropriate document. Review NC comments on CDC on 60825-17 amendment, and initiate work on next appropriate document. Initiate work on CD on 60825-12 amendment.

Submit a FDIS for Annex G (Normative) to 60825-4 for Guideline for Beam Delivery Guards by December 31, 2007. At Beijing, Review the NC comments on FDIS, and formulate the revision to the test conditions in Clause 2D of Annex D on the FDIS,.

Publish TR 60825-3 by February 29, 2008. Submit a CDC on Label Simplification by March 31, 2087. Circulate a CDC on an amendment to TR 60825-14, User's Guide, by July 31, 2008. Withdraw TR 60825-10, by September 30, 2008. Circulate a CDC on an amendment to TR 60825-5, Manufacturer's Checklist, by July 31, 2008. At Beijing, review NC comments on Label Simplification CDC and initiate work on next appropriate document. Review NC comments on TR 60825-14 amendment and initiate work on next appropriate document. Review NC comments on TR 60825-5 amendment and initiate work on next appropriate document.

Circulate the second CD on TR 62471-2 by November 30, 2007 Circulate the CDV(DTR) on TR 62471-2 by May 15, 2008. Review the base lamp safety standard 62471-1 in a joint effort with CIE TC 6-47 and IEC TC 34 At Beijing, review the NC comments on the CDV and initiate work on the publication of TR 62471-2. Discuss the revision of IEC 62471-1.

Circulate a CDV on ISO/IEC 11531-3 (Noise) by February 15, 2008. At Beijing, Review the NC comments on the CDV and initiate work on the next appropriate document.

C.2 Resources/infrastructure needed

We could use a French expert to translate documents. This situation has improved, but we are still experiencing delays in issuing some of our documents, waiting for French translations.

D. Future work

Since this still an emerging technology, we expect our work will expand. We anticipate that the new work described in the Business Environment and new trends in Technology can be incorporated into our existing WGs, however additional expertise is very desirable to handle the increased workload, as well as helping with the particulars of new applications. This growth may present a problem with having a sufficient number of working group meetings during a 5-day TC meeting

E. Maintenance cycle

Publication no.	Date of publication	Review date	Validity date	Responsibility (Maintenance Team)
IEC 60601-2-22 Ed.3.0	2007-05		2010	WG 4
IEC 60825-1 Ed.2	2007-03		2011	WG 1
IEC 60825-2 Ed.3	2004-06	2006	2009	WG 5
IEC 60825-3 TR Ed.1.0	2008-03		2012	WG 8
IEC 60825-4 Ed.2.0	2006-08		2010	WG 7
IEC 60825-5 TR Ed. 2.0	2005-11		2010	WG 8
IEC 60825-8 TR Ed.2.0	2006-12		2011	WG 4
IEC 60825-9 TR Ed.1.0	1999-10	2006	2010	WG 9
IEC 60825-10 TR Ed.1.0	2002-02	2006	2010	WG 8
IEC 60825-12	2005-01	2006	2011	WG 5
IEC 60825-13 TR Ed.1.0	2006-08		2010	WG 3
IEC 60825-14 TR Ed.1.0	2004-02	2005	2010	WG 8
IEC 61040 Ed.1.0	1990-11	2006	2010	WG 3
IEC 62471-1	2006-07		2010	WG 9
ISO/IEC 11553-1	2005-02	2005	2010	WG 10

Name or signature of the secretary

Gerald L. Glen