



DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
2300 E STREET NW
WASHINGTON DC 20372-5300

IN REPLY REFER TO

BUMEDINST 6470.19A
BUMED-M3F7
23 May 2005

BUMED INSTRUCTION 6470.19A

From: Chief, Bureau of Medicine and Surgery
To: Ships and Stations Having Medical Department Personnel

Subj: LASER SAFETY AT MILITARY FACILITIES AND RESEARCH
LABORATORIES

Ref: (a) ANSI Z136.1 (2000), American National Standard Safe Use of Lasers (NOTAL)
(b) ANSI Z136.3 (2005), American National Standard for Safe Use of Lasers in Health Care Facilities (NOTAL)
(c) BUMEDINST 6470.23
(d) Title 21, Code of Federal Regulations, Part 1040
(e) BUMEDINST 6320.66D
(f) OPNAVINST 5100.23F, Chapter 14, Mishap Investigation, Reporting, and Recordkeeping
(g) OPNAVINST 5100.23F, Chapter 22, Non-Ionizing Radiation

1. Purpose. To issue laser safety policy and guidance for military facilities and research laboratories. This is a complete revision and must be read in its entirety.
2. Cancellation. BUMEDINST 6470.19.
3. Scope. This instruction applies to military facilities and research laboratories with lasers or laser systems for diagnostic, therapeutic and research use. This instruction is not applicable for lasers or laser systems used in military, industrial, and nonmedical research operations.
4. Background. Reference (a) provides recommendations for the safe use of lasers and laser systems (including laser classification and control measures). Reference (b) provides guidance for the safe use of lasers for diagnostic and therapeutic applications in health care facilities. Reference (c) issues permissible exposure limits, medical surveillance requirements, and casualty management procedures for personnel exposed to non-ionizing (including laser) radiation. Reference (d) gives performance standards for light-emitting products. Reference (e) issues policy and procedures on the Credentials Review and Privileging Program. References (f) and (g) give the Navy Occupational Safety and Health (NAVOSH) requirements for mishap reporting and non-ionizing radiation, respectively.

5. Definitions

a. Laser. An acronym for light amplification by stimulated emission of radiation. Any device that can be made to produce or amplify electromagnetic radiation in the x-ray, ultraviolet, visible, and infrared or other portions of the spectrum by the process of controlled stimulated emission of photons.

b. Laser Mishap. Any unplanned or unexpected event causing material loss or damage or causing personnel injury from laser use.

c. Laser Classification. A hazard classification scheme, per references (a) and (b), based primarily on the ability of the laser beam to cause damage to the eye. This classification ranges from Class 1 lasers that are safe for direct beam viewing under most conditions, to Class 4 lasers that require the strictest controls. Laser product classification pertains to intended use only. Laser classification may change to a more hazardous class when a laser product is disassembled for maintenance or protective features are removed. Manufacturers of laser products are required to certify that their products comply with reference (d).

d. Laser Injury. Injury caused by exposure to a laser beam. Burns to the retina and skin are examples of laser injuries.

e. Laser Safety Committee. A committee of command-appointed health care professionals meeting at least quarterly to review the status of the command's Laser Safety Program.

f. Laser System Safety Officer (LSSO). One who has authority to monitor and enforce the control of laser hazards and effect the knowledgeable evaluation and control of laser hazards.

g. Laser System. An assembly of electrical, mechanical, and optical components, which includes a laser.

6. Responsibilities

a. Chief, Bureau of Medicine and Surgery (BUMED) shall:

(1) Serve as primary point of contact with Chief of Naval Operations directorates, systems commands, and other Government agencies for the safe use of medical lasers at military facilities and research laboratories.

(2) Represent Navy Medicine on the American National Standards Institute (ANSI) Committees issuing references (a) and (b).

(3) Issue policy and guidance for Laser Safety Programs and Laser Medical Surveillance Programs at military facilities and research laboratories per this instruction and reference (c).

b. The Navy Environmental Health Center shall provide technical assistance and guidance to LSSOs at military facilities and research laboratories.

c. Commanders, Commanding Officers, and Officers in Charge shall:

(1) Establish a Laser Safety Program per references (a), through (c), as applicable.

(2) Appoint an LSSO in writing with provision for direct access to Commanders, Commanding Officers and Officers in Charge for any issues regarding the command's Laser Safety Program.

(3) Establish a Laser Safety Committee at the command.

(4) Coordinate with the Navy Environmental Health Center to have Naval Surface Warfare Center, Dahlgren Division, (Code G-72) evaluate locally designed, constructed, or modified laser or laser systems not used as originally intended by the manufacturer, or not classified per reference (d).

(5) Ensure physicians and health care providers who perform medical treatment or surgical procedures using lasers, possess the appropriate core or supplemental privileges, per reference (e).

d. Laser System Safety Officers shall:

(1) Execute LSSO specific responsibilities in references (b) and (c).

(2) Be trained to meet the requirements of references (b) and (c). Many commercially available organizations offer LSSO classes.

(3) Serve as Chairman, Laser Safety Committee for the command.

(4) Inspect all areas where laser equipment is used at least annually and correct noted problems, per references (a) and (b).

(5) Report all known or suspected laser mishaps as detailed in paragraph 7, Overexposure Incidents.

(6) Maintain a current inventory of Class 3b and Class 4 lasers and laser systems. Submit the inventory as directed by BUMED (M3F72).

(7) Execute a Laser Medical Surveillance Program, per reference (c).

(8) Develop written standard operating procedures and checklists to complement the manufacturer's operating instructions, manuals, or operating procedures for the safe use of each laser and laser system. Review these documents, at least annually, with the command's Laser Safety Committee.

(9) Ensure appropriate laser safety personal protective equipment is available and use is enforced. Semiannually inspect and assure laser eye protection (LEP) equipment is in proper working order and condition, per reference (a). All LEP equipment should be examined for scratches, cracks, and discoloration prior to use. Take appropriate action and replace all defective or unsuitable LEP equipment.

(10) At least annually, train laser operators and support staff in the safe use of lasers per references (a), through (c) to include command-specific requirements. Maintain a roster of completed training and retain for a minimum of 3 years.

7. Overexposure Incidents

a. Immediate consultation shall be obtained with an ophthalmologist or optometrist for personnel with suspected or observed laser exposure. Since early medical intervention may lessen the severity of the damage or subsequent retinal scarring for the laser injury, efforts should be made to have the individual promptly seen by an ophthalmologist or at the ophthalmology department of a hospital, on an urgent basis. Incidents involving suspected or observed laser eye injury require a complete medical examination. Notify BUMED (M3F72) by fax, message or telephone of suspected or observed laser exposure as soon as possible at: commercial (202) 762-3448/3444, DSN 762-3448/3444, fax commercial (202) 762-0931, DSN 762-0931. Medical evaluation and treatment of laser injuries is detailed in reference (c).

b. Submit a Laser Incident Report (MED 6470-16) for all cases where personnel are inadvertently exposed to laser energy. This report is required for all incidents involving personnel with suspected or observed exposure to Class 3b or Class 4 lasers. Laser Incident Reports are also required when the exposure circumstances, or the severity of the incident or mishap, are such that inquires from news media are anticipated, or it is deemed to be in the best interest of the command. The report shall be sent by the LSSO to BUMED within 30 days of the incident and shall include:

(1) List of personnel involved.

(2) Estimation of laser exposure received to the eyes or skin as related to the applicable maximum permissible exposure (MPE), per reference (a).

(3) The examining medical officer's immediate and subsequent medical finding (if applicable), including pertinent medical records and retinal photographs.

(4) A detailed account of the laser exposure incident. Include the laser's parameters as applicable: wavelength, energy, pulse repetition frequency, pulse length, beam diameter, and divergence.

(5) A detailed account of safety procedures and personal protective equipment used at the time of the laser exposure incident.

(6) Lessons learned and actions completed to prevent another laser exposure incident.

c. Submit a Safety Investigation Report per references (f) and (g) for all incidents that meet the safety investigation thresholds.

d. Submit a hazard report for any work-related events that could have potentially resulted in a laser exposure; such as using defective safety equipment or inadequate standard operating procedures, using the Laser Incident Report criteria in paragraph 7b, as applicable.

8. Points of Contact

a. Medical and dental lasers and laser systems assistance or evaluations: Naval Environmental Health Center (Code M11), 620 John Paul Jones Circle, Suite 1100, Portsmouth, VA 23708-2103, telephone, DSN 377-0700, commercial (757) 953-0700, or fax (757) 953-0685.

b. Laser systems safety evaluations: Naval Surface Warfare Center, Dahlgren Division, (Code G-72), 17320 Dahlgren Road, Dahlgren, VA 22448-5000, telephone, DSN 249-1060/1149/2442, commercial (540) 653-1060/1149/2442, fax (540) 653-8453, or on the Web at: <http://navylasersafety.com>.

c. Laser bioeffects, medical research, and evaluating laser injuries: Naval Health Research Center Detachment, Brooks City Base, 8301 Navy Road, Brooks AFB, TX 78235-5365, telephone, DSN 240-6924/6552, commercial (210) 536-6924/6552, or fax (210) 536-6439/1466.

d. Laser safety program policy: BUMED (M3F72), 2300 E Street, NW, Washington, DC 20372-5300, telephone, DSN 762-3448, commercial (202) 762-3448/3444, or fax (202) 762-0931.

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e. Laser eye protection: Naval Air Warfare Center, Aircraft Division, 48100 Shaw Road, Patuxent River, MD 20670-1906, telephone, DSN 342-8480, commercial (301) 342-8480, or fax (301) 342-8801.

f. Occupational Health and Safety: Naval Safety Center, 375 A Street, Norfolk, VA 23511-4399, telephone, DSN 564-3520, commercial (757) 444-3520, or on the Web at: <http://www.safetycenter.navy.mil/>.

9. Report. The Laser Incident Report required by paragraph 7b is assigned report control symbol MED 6470-16. This report has been approved by the Chief, Bureau of Medicine and Surgery.



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