UNITED STATES MARINE CORPS
MARINE CORPS RECRUIT DEPOT/EASTERN RECRUITING REGION
PO BOX 19001
PARRIS ISLAND, SOUTH CAROLINA 29905-9580

DepO 5104.2A
SAF
0 2 MAR 2020

DEPOT ORDER 5104.2A

From: Commanding General
To: Distribution List

Subj: LASER HAZARDS CONTROL PROGRAM

Ref: (a) OPNAVINST 5100.27B/MCO 5104.1C
(b) 21 CFR 1040
(c) MIL-HDBK-828E
(d) OPNAVINST 5102.1D/MCO P5102.1B
(e) DepO 5100.16F
(f) ANSI Z136.1
(g) SECNAVINST 5100.14E
(h) DoD 4160.21-M

Encl: (1) Example Laser Warning Signs
(2) Laser Classification and Risk Assessment
(3) Example of Military Exempt Laser Inventory
(4) Example of Non-Military Exempt Class 3b and 4 Laser Inventory Format
(5) Glossary of Terms

1. Situation. As directed by guidance in references (a) through (g), this Order provides the policy, assigns responsibility, and presents requirements for the administration of the Marine Corps Recruit Depot Parris Island/Eastern Recruiting Region (MCRDPI/ERR) Laser Hazards Control Program (LHCP) as a component of the MDRDPI/ERR Safety Program implemented by references (a) and (e).

2. Cancellation. DepO 5104.2

3. Mission. This Order establishes a formal LHCP within MCRD and any ERR commands participating in applicable laser use structure to minimize the risk of injury to personnel and the general public, and damage to equipment from improper use. This order applies to all MCRDPI/ERR commands procuring, possessing, using, or responsible for training users of lasers. This order also applies to the use, design, disposal of all equipment and systems capable of producing laser radiation. This includes laser fiber optics and system support equipment, field military lasers used principally for target acquisition, training and fire

control. Medical, industrial, and construction laser systems that have no military-specific applications are exempt from this instruction. References (a) through (h) provide controls over laser design and operation for protection of personnel and equipment or contain specific information on various laser safety subjects.

4. Execution

a. Commander's Intent and Concept of Operations

(1) Commander's Intent

(a) Enhance unit and individual readiness by maintaining an effective LHCP in compliance with pertinent regulations.

(b) Control sources of laser radiation to minimize personnel exposures and to prevent injury or damage to personnel and equipment.

(c) Provide guidance and requirements for implementing references (a) through (g), for sources of laser radiation used within MCRDPI/ERR.

(2) Concept of Operations

(a) Per reference (a), commanders are responsible for establishing and implementing the following procedures which reduce the risk of laser related injuries:

1 Impose implementation and operating requirements of this instruction and enclosure (2) of reference (a) on equipment and facilities. Provide adequate warnings, safety training, documentation, and audits for the control of all hazards resulting from the use of lasers at their activities.

2 Ensure appropriate Laser Eye Protection (LEP) is worn by all personnel within the Nominal Hazard Zone (NHZ) during testing or operational use of any laser system with the unaided Optical Density (OD) requirement. If optical aids may be used in the exercise, LEP should meet the aided OD requirement.

3 Appoint a Laser Safety Systems Officer (LSSO) and forward the LSSO's name, organizational code and telephone number to the installation Administrative Laser Safety Officer (ALSO). The activity commander and LSSO will maintain control

over laser operations at the local activity. Training requirements are contained in reference (a).

4 Ensure that only those laser installations and ranges which have been certified by an RLSS and approved by the activity LSSO as safe for specific applications using specific laser systems are allowed to operate and then solely for those applications. Laser systems shall not be fired outside of these LSSO-designated areas and targets. Technical assistance is available from the Lead Navy Technical Laboratory (LNTL) on a cost reimbursable basis to enable commanding officers and their LSSOs to certify the safety of their laser ranges. The commanding officer is responsible for range certification and use per MCO 3570.1C.

5 Use and dispose of military exempt lasers per reference (a). Obtain approval of the Administrative Lead Agent (ALA) prior to disposal. The LSRB may be used to ensure that the system is demilitarized per reference (a) or disposed of in accordance with reference (h) that will prevent public access to military exempt technology.

6 Maintain a current inventory of all military exempt lasers and all class 3b and class 4 lasers as defined in reference (a) for submission to the ALA as requested. A sample format for submission of military exempt laser data is given in enclosure (1). A sample format for submission of non-military exempt class 3b and class 4 lasers is given in enclosure (2). The LSSO shall keep the inventory of military exempt and class 3b and class 4 lasers. Report lost lasers to the ALA using the inventory formats given in enclosures (1) and (2).

7 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. First aid should not be attempted for damage produced by laser energy to the eye. Prompt reporting to a medical treatment facility is imperative for known or suspected laser injuries. For reporting, the following department notifications are required:

a Depot Safety Office per reference (d).

b Bureau of Medicine and Surgery (BUMED, M3B4) by electronic mail, fax, message or telephone of suspected or

observed laser exposure as soon as possible at commercial (202) 62-3448, DSN 762-3448, fax commercial (202) 762-0931, DSN 762-0931. Additionally, contact the tri-service laser safety hotline (800-473-3549) as soon as possible.

8 Submit a laser incident report for all cases where personnel are inadvertently exposed to laser energy and maintain the laser incident reports per reference (q) of reference (a). This report is required for all incidents involving personnel with suspected or observed exposure to class 3b or class 4 lasers. The report shall be sent by the LSSO to BUMED within 30 days of the incident per reference (a).

9 Submit a safety investigation report per reference (d).

10 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 7e(9) of reference (a) as applicable.

11 Ensure laser equipment is approved by the LSRB for all class 3b, class 4 and military exempt lasers.

b. Per enclosure (3), Navy and Marine Corps regions, commands, or activities having only class 1, 2, and 3a or 3r lasers not used in combat, combat training or classified in the interest of national security are not required to assign an LSSO. However, they shall:

(1) Ensure users read manufacturer literature and labeling.

(2) Report any instances of contact of the laser beam with an eye to the safety office immediately.

c. The LSSO is responsible for monitoring the unit laser hazard control program, training and coordinating laser safety classes when required and informing the commander of the potential laser risk to personnel.

d. Unit Supervisory Personnel are responsible for directly monitoring personnel and ensuring adequate safety precautions are taken to prevent laser related injury.

e. Incidental workers are personnel whose work makes it possible to be exposed to laser energy, in amounts sufficient to damage the eyes. Examples are:

(1) Operators of fielded laser equipment.

(2) Personnel involved in laser use on approved laser ranges.

(3) Personnel involved in "force on force" laser training exercises (when adequate protection, administrative and/or protective equipment is provided).

(4) Personnel involved on a short-term basis in research, development, test and evaluation or maintenance of laser equipment.

f. Laser workers are personnel who work routinely in laser environments and have a higher risk of accidental overexposure. Personnel regularly involved in maintenance of laser equipment or who work in situations where adequate protective measure cannot be provided.

g. Range Personnel that are exposed to laser hazards must be briefed by the Laser Range Safety Officer (LRSO). Proper personal protective equipment for eyes and skin will be provided.

h. All personnel must obey WARNING signs and placards when around the operation or maintenance lasers. An example of warning signs are contained in enclosure (1).

i. Other responsibilities and restrictions are contained in reference (a) under the following sections:

(1) Activity Laser Hazard Control Program;

(2) General Laser Hazard Control Program;

(3) Laser Firing Log;

(4) Safety Requirements for Military Laser Ranges;

(5) Laboratory Laser Use and Laser Maintenance Requirements.

5. Administration and Logistics

a. Recommendations for changes or modifications to this order will be provided to the Commanding General (Attn: Depot Safety Manager) for staffing.

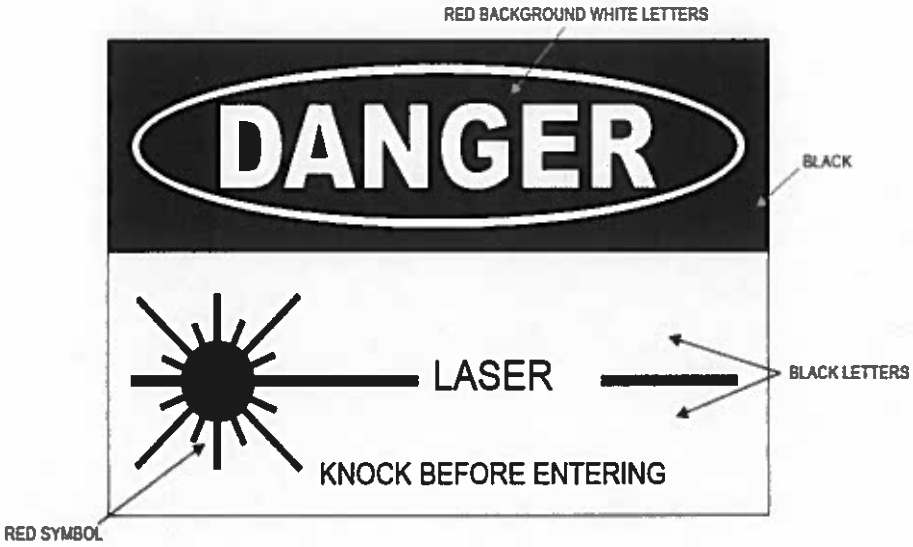
6. Command and Signal

a. Command. This Depot Order is applicable to tenant commands and visitors operating lasers and associated equipment. Commanders will ensure strict compliance with references (a) through (h) and this order.

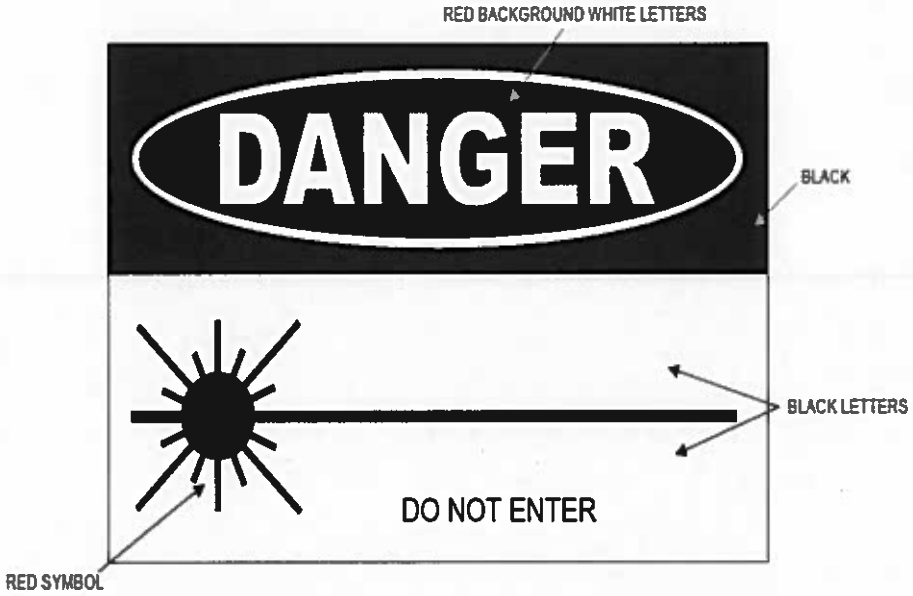
b. Signal. This Order is effective the date signed.

C. J. WILLIAMS
Chief of Staff

Distribution: A



Laser Maintenance Area Warning Sign



Laser Range Warning Sign

Laser Classification and Risk Assessment

Class	Energy	Hazards	Risk Assessment
Class 1	Depends on wavelength. Example: AN/PAQ-4C, Infrared Aiming Light (830 nm) below 0.7 milliWatt (mW). CW=Continuous Wavelength	Incapable of producing damaging radiation.	Severity: Cat IV Hazard Probability: D Risk Assessment: 5
Class 2 (visible Lasers only)	Depends on wavelength. Example: CW Helium neon alignment lasers. AN PEM-1 Laser Bore Site. Cannot exceed 1 mW.	Eye protection usually afforded by the aversion response (0.25 second(s) for visible). Hazards comparable to projectors or the sun.	Severity: Cat III Hazard Probability: D Risk Assessment: 4
Class 3 (3a, 3R, 3b)	Class 3a (Class 3r). Depending on wavelength: Between 1 and 5 times the Class 1 or Class 2 allowable emission limit (AEL) Example: Multiple Integrated Laser Engagement System (MILES) devices.	Direct and specular reflection viewing. hazards. Diffuse reflection is usually not a hazard.	Severity: Cat III Hazard Probability: C Risk Assessment: 4
	Class 3b. CW and repetitively pulsed lasers: cannot exceed 0.5 Watts (W) 0.25 s. Example: AN/PEQ 15 Infrared Aiming Light Pulsed lasers: Cannot exceed 0.030 Joules (CA J/ Pulse or 0.125 J within 0.25 s).	Direct and specular reflection viewing. Diffuse reflection is usually not a hazard.	Severity: Cat II Hazard Probability: C Risk Assessment: 3
Class 4 (see Note 2)	Class 4 lasers/lasers that emit radiation that exceed the AEL of Class 3b.	Severe skin and eye damage. Diffuse reflection hazard. Most hazardous laser class.	Severity: Cat I Hazard Probability: C Risk Assessment: 2

Note 1: Laser Classifications are according to ANSI Z136.

Note 2: AN/PEQ 15 has Class 1, 3a, and 3b capabilities depending on selector position Chosen and can become a Class 4 if disassembled and safety block removed.

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EXAMPLE DEPOT MILITARY EXEMPT LASER INVENTORY

From: Depot Safety Manager
To: Commanding General

Subj: EXEMPT and CLASS 3b LASER INVENTORY REPORT FOR FY__

Encl:

System Name:

Type:

Manufacturer:

Approved by LSRB? (Y) _ (N)_ If no, explain:
_____

Exemption Qualification (Check applicable spaces)
Combat: Training: __ Classified: __

Optional: N/A Contract Number: N/A

Total to date in this contract: N/A

NSN:

Serial Numbers: See Attachment

STATUS
Subtotals should add up to quantity possessed. Disposed lasers shall be maintained as a separate part of the inventory. Lost lasers shall be reported immediately to the ALA.

Quantity Possessed: ___

Subtotals: In use: ___ Repair: __ Storage: __ Awaiting Disposal: __

Laser Location(s): _____

Custodian Name(s): _____

Phone: _____

Signature(s)_____

Enclosure (3)

EXAMPLE DEPOT NON-MILITARY EXEMPT CLASS 3B/ASS 4 LASER INVENTORY

From: Depot Safety Manager
To: Commanding General

Subj: CLASS 3B AND CLASS 4 LASER INVENTORY REPORT FOR FY__

Laser Name_____

Type_____

Wavelength_____ Max. Output_____

Pulse or Continuous Wave (CW) _____ Class_____

Program/User/Custodian

Name(s)_____

Phone_____

Location(s)_____

Use(s)_____

Optional: Manufacturer_____

Contract Number_____

NSN_____

Plant Account Numbers_____

Serial Number(s)_____

Signature(s)_____

Enclosure (4)

GLOSSARY OF TERMS

Administrative Laser Safety Officer (ALSO). One who has successfully completed an Administrative Lead Agent (ALA) and Lead Navy Technical Laboratory (LNTL)-approved ALSO course.

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 stimulated emission of photons.

Laser Classifications. There are four laser hazard classifications that determine the required extent of radiation safety controls. These range from class 1 lasers that are safe for direct beam viewing under most conditions to class 4 lasers that require the strictest of controls. Laser product classification pertains to intended use only. When a laser product is disassembled for maintenance, etc., and protective features removed, the laser classification may change to a more hazardous class. Laser classifications and controls for each class are contained in enclosure (4).

Laser System Safety Officer (LSSO). A generic term used that can refer to personnel functioning as an ALSO, TLSO, LSS or Range Laser Safety Specialist (RLSS).

Laser Safety Specialist (LSS). One who has successfully completed the ALA and LNTL-approved LSS course. The Technical Laser Safety Officer (TLSO) course is a prerequisite for the LSS course. The LSS qualification is an advanced laser system safety officer. An LSS possesses the technical knowledge required to perform laser measurements, hazard evaluations, and calculations.

Military Exempt Lasers. Lasers designed for actual combat, combat training operations, or classified in the interest of national security and are exempted from the requirements of reference (b). Military exempt laser systems must comply with the design requirements provided in enclosure (2) of reference (a).

Nominal Hazard Zone (NHZ). The volume of space within which the level of the direct, reflected, or scattered laser radiation may exceed the applicable Maximum Permissible Exposure (MPE) level.

Range Laser Safety Officer (RLSO). One who has successfully completed an ALA- and LNTL-approved TLSO course. An RLSO is a TLSO with assigned laser range management responsibilities as outlined in paragraph 5 of enclosure (8). RLSOs are qualified to perform the duties of an ALSO with emphasis on outdoor use of lasers. RLSOs are not qualified to perform laser or laser range hazard evaluations and calculations.

Range Laser Safety Specialist (RLSS). One who has successfully completed the ALA- and LNTL-approved RLSS course. The TLSO course is a prerequisite for the RLSS course. The RLSS possesses the technical knowledge required to perform laser range hazard evaluations and calculations required for laser range certification.

Technical Laser System Safety Officer (TLSO). One who has successfully completed an ALA- and LNTL-approved TLSO course. TLSOs are qualified to perform the duties of both ALSOs and RLSOs, but are not qualified to perform laser or laser range hazard evaluations and calculations.

All other terms relating to lasers shall be those given in references (a) and (b).