

OFFICE OF SECURE TRANSPORTATION

POLICY NUMBER: 3.07A

TITLE: Laser/Safety Utilization

EFFECTIVE DATE: 28 September 2005

PURPOSE: To provide guidance and direction for the safe use of laser equipment during Force on Force exercises and training

SCOPE: Office of Secure Transportation (OST) personnel both Federal and contractor while performing Force-on-Force exercise/training venues. This also extends to other agencies or organizations that employ OST equipment in an Engagement Simulation System (ESS) environment. This also applies to all observers and non-participants in the training area, which will have appropriate safety briefings and clearly defined expectations while in this potentially hazardous environment.

PROPONENT: Office of Support/Safety, Security and Emergency Management Division

REFERENCES:

- American National Standard for Safe Use of Lasers (ANSI) Z136.1-2000
- ANSI Z136.6-2000
- DOE STD-1091-96
- DOE O 470.4
- 21 CFR 1040, Federal Laser Product Performance Standard (FLPPS)

Review Notes: Updated organizational titles and paragraph 3h(4)(d) concerning laser safety briefing requirements

POLICY

1. General Information

This policy is driven by changes in the Multiple Integrated Laser Engagement System (MILES) specifications, the publication of a new ANSI standard specifically addressing the use of direct-fire simulators, and the addition of other solid-state laser devices to the ESS equipment to include laser pointers, laser scopes, and laser illuminators.

2. Responsibilities

- a. The Assistant Deputy Administrator (ADA) shall:
 - (1) Ensure OST Federal and contractor ESS exercises/training utilizing lasers comply with stated references to include lending equipment to other agencies.
- b. The Office of Mission Operations, Manager and Office of Support, Manager shall:
 - (1) Be responsible for ensuring the OST Laser Safety/Utilization policy is adhered to by all participants of exercises/training, including classroom and force-on-force engagements, tactical training and other situations on-site and off-site.
- c. Training and Logistics Command (TRALOC) shall:
 - (1) Be responsible for the procurement, storage, maintenance and issuance of all laser equipment and shall be responsible for the development, implementation and administration of OST Laser Safety and Utilization.

- (2) Be responsible for the technical development and implementation of adequate lesson plans and training procedures.
- (3) Ensure Force-on-Force engagement training participants comply with OST policy and established procedures while participating in DOE exercises/training environments.
- (4) Instructors (federal and contractor) shall implement policy and procedures during engagement training, including classroom, field training, tactical training, field exercises, and other situations on-site and off-site.
- d. Safety, Security and Emergency Management Division (SSEMD) shall:
 - (1) Ensure the safety and health of employees; OST supported training internally and external agencies, and the public in general through the application of existing stated references and site-specific procedures.
 - (2) Review and endorse appropriate exercise and training plans for internal and external use of ESS laser equipment.

3. Requirements

- a. This policy recognizes that the American National Standard for the Safe Use of Lasers Outdoors (ANSI Z136.6-2000) is not intended to replace or supercede ANSI Z136.1-2000, but rather sets forth the requirements for the safe use of ESS laser equipment at the ANSI Z136.1-2000 Class 3a accessible emission limit (AEL).
- b. Safety issues and hazards associated with a particular force-on-force exercise are identified in the Safety Plan which exercise participants are required to read and sign. In addition, a safety briefing is conducted to educate and inform all participants and observers about safety, environmental concerns, and rules associated with the exercise. A sample safety briefing, including viewgraphs, is also included in the Safety Plan.
- c. All ESS devices used in force-on-force exercises are approved by the OST Laser Safety Officer (LSO).
- d. Only ESS modified firearms and ESS equipment shall be used to ensure the safety and health of OST, agency participants' contractors, and other involved participants as well as the public, and is consistent with NNSA operational objectives.
- e. All operational and field use of lasers within NNSA shall comply with ANSI standards as required by DOE STD-1091-96. This standard references ANSI Z136.1-1986, which has been superceded by ANSI Z136.1-2000 and with 21 CFR 1040. Of these two, the ANSI standard is the more stringent.
- f. OST and TRALOC Standard Operating Procedures are in place prior to use to ensure the safe maintenance, storage, issue, and use of all laser ESS equipment.
- g. Area Warning Signs:
 - (1) There shall be two different area signs: One type is permanently posted which identifies the presence and limits of the designated training area. The other type, to be posted at key entry/exit locations, should be set out daily (or as appropriate) when laser range operations begin and picked up once laser operations are complete.
 - (2) The sign dimensions, letter size and color, etc. shall be in accordance with ANSI Z535. The signs should include an accepted laser hazard symbol, the signal word "CAUTION" (for Class 3a), and other relevant information (laser Class, power or pulse width, wavelength, etc).
- h. Class 3a Direct Fire Simulators ESS equipment requirements:
 - (1) The Technical Laser System Safety Authority (TLSSA) approves the use of Class 3a ESS equipment.
 - (2) Use of Class 3a ESS equipment is confined to a designated training area.
 - (3) Engineering Controls:

- (a) Commercial products manufactured in compliance with FDA standards will be certified by the manufacturer and will incorporate only those engineering controls required by FDA.
 - (b) For Class 3a ESS use within NNSA, the applicable engineering controls include protective housings, labels, and area posting signs. These controls are discussed below:
 - Protective Housing: A protective housing shall be provided for all classes of lasers or laser systems.
 - Identification Label: Every laser product shall be provided with an identification label that contains the full name and address of the manufacturer, the laser model, serial number, and the month and year of manufacture.
 - Laser Warning Labels: Laser warning labels containing the sunburst logotype symbol shall be placed on all lasers except Class 1. DOE Bulletin EH-0020-17 recommends the use of an "ANSI-type CAUTION label" even for Class 1 laser transmitters. They shall state whether the beam is visible or invisible, the output power or energy per pulse, the pulse characteristics and wavelength, and provide clear instructions to preclude laser injury.
 - Aperture Label: Class 2 through Class 4 lasers shall have the laser exit port clearly indicated with a label ("laser aperture", "laser radiation is emitted from this aperture", etc).
 - Emission Indicators: An indication shall be visible to the operator whenever an invisible Class 3a laser is emitting.
 - Laser Area Warning Signs and Activation Warning: The purpose of a laser area warning sign is to convey a rapid visual hazard-alerting message that:
 - (i) Warns of the presence of a laser hazard in the area.
 - (ii) Indicates specific policy in effect relative to laser controls.
 - (iii) Indicates the severity of the hazard (e.g. the class of the laser, etc).
 - (iv) Instructs appropriate action(s) to take to avoid the hazard.
 - The laser warning signs required for use of devices not exceeding ANSI class 3a AEL shall utilize warning statements, where the signal words have the following meanings:
 - (i) "CAUTION" indicates a potentially hazardous situation, which if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.
 - (ii) "NOTICE" is used to indicate a statement of facility policy as the message relates directly or indirectly to the safety of personnel or the protection of property. This signal word shall not be associated directly with a hazard or hazardous situation and must not be used in place of "DANGER" or "CAUTION".
- (4) Administrative and Procedural Controls:
- (a) Administrative and Procedural Controls required for outdoor use of ESS-type Class 3a lasers and laser system include Education/Training and Alignment Procedures. A specific requirement of Class 3a laser use in a direct fire simulator is "all participants to receive specialized training". The exact content, duration, frequency, and other particulars of the training are to be determined and specified by the Laser Safety Officer (LSO).
 - (b) DOE safety personnel currently provide appropriate training per LSO requirements to all exercise participants and support personnel prior to the beginning of each series of exercises.
 - Training Requirements: Laser workers shall receive training commensurate with the specific lasers with which they will be associated and to the highest class lasers to which they will be

exposed. The training may be in the form of a formal course or may be administered through specific standing operating procedures and literature supplied by the LSO.

- (c) Alignment Procedures: Alignment of Class 2, 3a, 3b, or 4 laser optical systems (mirrors, lenses, beam deflectors, etc) shall be performed in such a manner that the primary beam, or a specular or diffuse reflection of a beam, does not expose the eye to a level above the acceptable MPE.
- (d) DOE safety personnel shall brief all exercise participants as appropriate of the nominal ocular hazard zones (NOHZ) that exists. The standard laser safety rules will also be briefed.

OFFICIAL:



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