

JSC Safety and Health Handbook	JPR No.	1700.1K
	Effective Date:	11/25/2013
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	Page Number	Page 6.2-1 of 3

Chapter 6.2 Laser Safety and Health

This could be you . . .

Following safe practices have paid off. JSC has no recorded laser incidents.

6.2.1 Applicability of this chapter

You are required to follow this chapter if you operate lasers or supervise anyone who operates lasers.

6.2.2 Laser pointers

a. Laser pointers meeting all of these criteria are exempt from the requirements of this chapter:

- (1) Not exceed a maximum power level of 5 mW
- (2) Emit in the visible portion of the spectrum (0.4 to 0.7 μm)
- (3) Have a beam diameter of less than 7 mm
- (4) Have a label that indicates it is a Class 2 or Class 3a/IIIa/3R laser
- (5) Used only as a pointer

b. Follow these prudent practices when using a laser pointer:

- (1) Never point a laser pointer at anyone.
- (2) Never stare into a laser pointer.
- (3) Avoid "mirror-like" (specular) targets.
- (4) Never view the laser beam using optics.
- (5) Never use laser pointers that do not have laser radiation labeling.
- (6) Use the laser pointer that comes with the projector remote control whenever possible.
- (7) Use a red-beam laser pointer in training or meetings since the beam is not perceived to be as bright as the green beams at the same power output.
- (8) Always remove the batteries when the laser pointer is not in use.
- (9) Remember that laser pointers are not toys and should not be used by juveniles without instructions.

6.2.3 Laser classes

6.2.3.1 JSC uses the laser classes defined in LIA/ANSI Z136.1, "Safe Use of Lasers:"

- a. Class 1 and Class 1M lasers and laser systems
- b. Class 2 and Class 2M lasers and laser systems
- c. Class 3R lasers and laser systems (previously IIIa or 3A)

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JSC Safety and Health Handbook	JPR No.	1700.1K
	Effective Date:	11/25/2013
	Expiration Date:	11/25/2018
	Page Number	Page 6.2-2 of 3

- d. Class 3B lasers and laser systems (medium-power)
- e. Class 4 lasers and laser systems (high-power)

6.2.4 Requirements for working with lasers

6.2.4.1 You shall follow these requirements when you operate any lasers or laser systems:

- a. Before purchasing, using, or modifying any laser, laser system, or equipment that contains an embedded laser at JSC, Sonny Carter Training Facility (SCTF), or Ellington Field (EF), you shall contact the JSC Occupational Health Branch at x36726 for a laser hazard evaluation. The JSC Laser Safety Officer (LSO) or their designee will determine any documentation, approvals, engineering and administrative controls, personal protective equipment (PPE) and additional safety requirements and training necessary for the safe use of the laser or laser system.
- b. Follow LIA/ANSI Z136.1, LIA/ANSI Z136.6, 21 CFR 1040.10, “Laser products,” 21 CFR 1040.11, “Specific purposes of laser products,” paragraph 3.15 of NPR 8715.3, and chapter 4 of NPR 1800.1.
- c. Don’t operate a laser unless you are certified to do so by the LSO.
- d. Know the hazards and hazard controls of each laser you operate.
- e. Tell all visitors in your laser area what the laser hazards are and what safety requirements they need to follow. Visitors shall also:
 - (1) Be under the direct supervision of at least one certified operator.
 - (2) Wear required protective equipment.

6.2.5 Training required for laser operations

6.2.5.1 The JSC LSO determines what, if any, training and experience is commensurate with the laser hazards accessible at each facility. The JSC LSO designates all Area Laser Safety Officers (ALSOs) and certifies all laser operators (LOs). Training Categories are:

- a. **Laser operator.** The training and experience required for a certified LO may include, but is not necessarily limited to, the laser training topics as seen in LIA/ANSI Z136.1, “Safe Use of Lasers,” Appendix D6.2 (1). LOs are required to have initial and refresher training every 2 years thereafter. Training will be documented and maintained by the LO and the JSC LSO. A card will be issued for each laser operator certified by the JSC LSO.
- b. **Area laser safety officer.** The training and experience required for an ALSO may include, but is not necessarily limited to, the laser training topics as seen in LIA/ANSI Z136.1, “Safe Use of Lasers,” Appendix D6.2 (1) and (2). ALSOs are required to have an initial 40 hours of classroom training and refresher training every 2 years thereafter. Training will be documented and maintained by the ALSO and the JSC LSO.
- c. **Peripheral personnel (janitors, security, firefighters, waste handlers, etc.).** The ALSO and the LO are responsible for initial awareness-level laser safety training of peripheral personnel in their area such that they (peripheral personnel) understand the laser hazards associated with their work and are able to take appropriate actions to prevent unnecessary exposure.

JSC Safety and Health Handbook	JPR No.	1700.1K
	Effective Date:	11/25/2013
	Expiration Date:	11/25/2018
	Page Number	Page 6.2-3 of 3

d. In addition to the above training categories and topics, you shall be certified to operate a laser as described in Chapter 5.8 of this Handbook.

6.2.6 Emergency actions for laser mishaps

If a laser mishap occurs, follow the emergency procedures in Chapter 3.8, "Emergency Preparedness," of this Handbook and the emergency procedures for your facility. You shall contact the LSO as soon as possible to help you investigate the mishap.

6.2.7 Outdoor laser operations

Before using any laser or laser system outdoors, you shall contact the JSC Occupational Health Branch at x36726 for a laser hazard evaluation. LIA/ANSI Z136.6 provides guidance for the safe use of potentially hazardous lasers and laser systems (0.18 μm to 1 mm), in an outdoor environment. Beams directed into airspace may require coordination with the Federal Aviation Administration (FAA) and possibly the U.S. Space Command Laser Clearinghouse.

6.2.8 Responsibilities

The LSO shall fulfill the responsibilities in paragraph 3.15.5 of NPR 8715.3.