

Laser Light Show and Demonstration Safety

Bureau of Radiation Control Compliance Binder

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Laser Light Show ONLY

This template serves as a model route of achieving compliance. The use of this template is advised but not required by the Department.

Department Contact Information

Non-Ionizing Compliance Phone: 602-255-2515 email: nonion@azdhs.gov

Bureau of Radiation Control

4814 South 40th Street Phoenix, AZ 85040 Office: 602-255-4845 Web: www.azdhs.gov/nonion



Section 1. Guidance on Application for Registration

	Payment to submit			Forms to submit					Ref.	
Facility Type	Fee Category	Charge per Fee Category	Fee Category Definition/Calculation	BRC-NIR (one per location)	BRC-NIMI (one per unit)	Medical Director Acknowledgment; <i>Include</i> License & Training Record	LSO Acknowledgement; Include Training Record	Operator Training, FDA Variance, FAA Variance, & Show Details	Registration Division	Registration can be combined with:
Ultraviolet Tanning (UT) Ultraviolet Medical (UM)	F1	\$50	Per Unit	\checkmark	\checkmark				II	-
	F2	\$300	1-10 units	\checkmark	\checkmark		\checkmark		111	-
Laser Industrial (LI) Laser Projector (LP)	F3	\$600	11-49 units	\checkmark	\checkmark		$\checkmark\checkmark$		II	-
	F4	\$1,000	50+ units	\checkmark	\checkmark		\checkmark		I	-
Laser Light Show (LL)	F5	\$500	Site fee	\checkmark	\checkmark		\checkmark	\checkmark	II	-
Laser Medical (LM) -Includes: Chiro, Optham, Pod Laser Hospital (LH) Laser Dental (LD) Laser Veterinary (LV)	F6	\$100	Per Unit	\checkmark	\checkmark	\checkmark	$\checkmark\checkmark$		II	F12
Laser Cosmetic (LC) -Includes: Cosmetic use OR Cosmetic and Medical use	F7	\$100	Per Unit	\checkmark	\checkmark	$\checkmark\checkmark$	$\checkmark\checkmark$		II	F8, F12
Cosmetic Radiofrequency (RC)	F8	\$100	Per Unit	\checkmark	\checkmark	$\checkmark\checkmark$			11	F7
	F9	\$150	1-5 units	\checkmark	\checkmark				III	-
Industrial Radiofrequency (RF) -Includes: RF, Microwave	F10	\$350	6-20 units	\checkmark	\checkmark				П	-
	F11	\$600	21+ units	\checkmark	\checkmark				II	-
Medical Radiofrequency (RM) -Includes: RF, EC, Diathermy	F12	\$100	Site fee	\checkmark	\checkmark	$\checkmark\checkmark$			II	F6, F7

All forms are available on our website <u>AZDHS.GOV/NONION</u> under Nonionizing Forms

Note: Appropriate and full payment must be included with new registrations. We currently do not have the ability to accept new applications online, so please send your COMPLETE new application with payment via physical mail.

Section 2. Required Postings (There are 3 in total)

1. Include a copy of your Registration after this page, in addition to its posting on the wall.

Reference Image of Registration:

- <text><text><text><text><section-header>
- **2.** Post this notice in an area all employees have access to.

Reference Image of Notice to Employees:

	Arizona Departmen	it of Hea	Ith Services (Itman)
	NOTICE TO	EM	PLOYEES
in Artic of the	STANDARDS FOR PROTECTION AGAINST RADIATION; NOTICE de 4 of the Arizona Department of Health Services (AZDHS) rules for the Control of Radiation rules for the Control of Radiation, the AZDHS has established contain provisions for the optic	. the \$70H	5 has established standards for your protection apping radiation hangeds, in Article
Toure	YOUR EMPLOYER'S RESPONSIBILITY redown is required to -		rules. These Sections specify limits on exposure to radiation and exposure concentrations of radioactive material in air and water.
1. 2.	Apply these rules to work involving sources of radiation. Post or otherwise make available to you a copy of the A2DHS rules, licenses, and operating procedures which apply to work you are engaged in, and explain their	2	If you work where personnel monitoring is required, and if you request informa on your radiation exposures,
ь.	provisions to you. Post notice of violation involving radiological working conditions, propound		 Your employer must give you a written report, upon termination of y employment, of your radiation exposure;; and
	imposition of civil penalties, and orders.		b. Your employer must advise you armually of your expensive to radiation
	YOUR RESPONSIBILITY AS A WORKER		INSPECTIONS
proced	ould thematistice yourself with those previsions of the AZDHC rules and the operating tires which agily to the work you are emgaged in. You should adserve their produces it even protection and protection of your co-workers. WHAT IS COVERED BY THESE RULES	in add the re to rad	need or regulatered activities are subject to inspection by representatives of the AZ likes, any worksr or representative of workers who believes that there is a violation platform knowled thermufeer, or the terms of the employer's license or rules with re- relegical working conditions in which the subtrack is engaged, may request an inger- ding a notice of the angend violation to the AZEN. The request result are forch
1	Limits on exposure to radiation and radioactive material in restricted and unvestricted areas;	repres	ic grounds for the notice and must be signed by the worker on his own bahalf or entative of the workers. During inspections, A2DHS inspectors may confer priva
2.	Measures to be taken after assidental exposure; Personnel monitoring, surveys, and equipment; Caution ajess, labels, and after y interjok equipment;		workers, and any worker may bring to the attantion of the inspectors any pas it condition which he believes contributed to or caused any violation as descri-
5.	Exposure records and reports; Options for workers regarding AZDHS inspections; and		INQUARIES
7.	Related matters.	Impule	ies dealing with the matters outlined above can be sent to the:
	REPORTS ON YOUR RADIATION EXPOSURE HISTORY		Arizona Department of Health Services Bureau of Radiation Central
L	The Department's rules require that your employer give you a written report if you receive an exposure in excess of any applicable limit set forth in the rules or in the ficense. The basic limits for exposure to employees are set forth in Article 4 of the		4814 S. 43" Street, Phoenik, Arloona 85040 Office (602) 255-4845 http://aadhs.gov/licensing/radiation-regulatory/

Note: if you need a copy of your registration or notice to employees, please contact our office. We will send you one free of charge.

- **3.** Per A.A.C R9-7-1429, a Laser Danger Sign must be posted in the area(s) in which the laser is in use.
 - a. Sign must be labeled with the following:
 - i. "Invisible" and/or "Visible" Laser Radiation
 - ii. "Warning" or "Danger"
 - iii. Appropriate wavelength/power/class

Sign must follow ANSI format. (Link to generate your own compliant Danger Sign below)

http://lasertraining.org/DangerSigns.html

	WARNING OF DANGER				
Visible and/or Invisible	INVISIBLE LASER RADIATION AVOID EYE OR SKIN EXPOSURE TO DIRECT OR SCATTERED RADIATION LASER TYPE: WAVELENGTH: OUTPUT POWER:				
	CLASS LASER Class				
\Rightarrow NOTE: ONLY POST LASER SIGN WHEN LASER IS IN USE \Leftarrow					

Section 3. Laser Eyewear Inspection Log (Every six (6) MONTHS)

Date	Eyewear Identifier	Initials	Comment

R9-7-1435. Laser Protective Eyewear

- A. A registrant shall require that protective eyewear, as specified by the LSO, be worn by an individual who has access to: 1. Class 4 laser radiation; or 2. Class 3b laser radiation.
- B. A registrant shall, through the LSO, provide protective eyewear that is:
 - 1. Marked with a label that indicates the optical density protection afforded for the relevant laser wavelength;
 - 2. Maintained so that the protective properties of the eyewear are preserved;
 - 3. Inspected at intervals that do not exceed <u>six months</u> to ensure integrity of the protective properties; and
 - 4. Removed from service if the protective properties of the eyewear fall below the optical density on the label.
- *C.* A registrant shall maintain records of protective eyewear maintenance, inspection, and removal from service for <u>five years</u>.

Section 4. Functionality Test & User Manuals

WHAT TO INCLUDE IN THIS SECTION

- 1. Copy of user manual for each unit
- 2. Functionality Test Log (maintained up to date)

		Initials of who completed functionality test				
Date	Laser Make/Model	After Setup	Before Show			

**Per A.A.C. R9-7-1441(O), A registrant shall functionally test and evaluate all safety devices and procedures necessary to comply with this Article after setup, and before a laser light show or demonstration.

Section 5. Injury Reporting Policy and Injury Reports

WHAT TO INCLUDE IN THIS SECTION

- 1. Laser Injury Reporting Policy (Included on following page. Must be signed).
- 2. Copy of all injury reports.
- 3. Record of correspondence with the Department pertaining to any reported injuries sustained at this facility.



Laser Injury Reporting Policy

In accordance with A.A.C. R9-7-1436

- A. A registrant shall notify the Department by telephone within 24 hours of any incident that has caused or may have caused:
 - 1. Permanent loss of sight in either eye; or
 - 2. Third-degree burns of the skin involving more than 5 percent of the body surface as estimated by the rule of nines.
- B. A registrant shall notify the Department by telephone within five working days of any incident that has or may have caused:
 - 1. Any second-degree burn of the skin larger than one inch (2.54 centimeter) in greatest diameter; or
 - 2. Any third-degree burn of the skin; or
 - 3. An eye injury with any potential loss of sight.
- C. Each registrant shall file a written report with the Department of any known exposure of an individual to laser radiation or collateral radiation within 30 days of its discovery, describing:
 - 1. Each exposure of the individual to laser or collateral radiation that exceeds the applicable MPE; and
 - 2. Any incident that triggered a notice requirement in subsections (A) or (B).
- D. Each report required by subsection (C) shall describe the extent of exposure to each individual including:
 - 1. An estimate of the individual's exposure;
 - 2. The level of laser or collateral radiation involved;
 - 3. The cause of the exposure; and
 - 4. The corrective steps taken or planned to prevent a recurrence.

Submit all necessary exposure reports to:

BUREAU OF RADIATION CONTROL Nonionizing Compliance Program NONION@AZDHS.GOV

As the Laser Safety Officer, I attest that I have read the above laser injury reporting requirements and will uphold this responsibility assigned by my title to implement it fully for this registration.

Facility Name

Registration Number

LSO Printed Name and Title

LSO Signature

Date Position Assumed

NOTE: Complete this document and maintain it in your radiation safety program file. It will be reviewed during your unannounced State audits.

Section 6. Training Records

WHAT TO INCLUDE IN THIS SECTION

- 1. Training records for all operators
- 2. Training record for the Laser Safety Officer

Training Guidance:

- Operator training may be obtained anywhere (training institution, peer training, inservice, etc...) as long as the event is approved by the Laser Safety Officer.
- Laser Safety Officer may be obtained anywhere as long as it follows the required curriculum provided in Appendix D of Article 14 of the Bureau's rules on Nonionizing Radiation. (Provided at the end of this compliance binder for reference)

A.A.C. R9-7-1403. General Safety Provisions

(B.) The registrant shall:

(1.) Ensure that any nonionizing source is operated by an individual who is trained and has demonstrated competence in the safe use of the source.

(2.) Provide safety rules to each individual who operates a nonionizing radiation source and determine whether the individual is aware of operating restrictions and procedures associated with the safe use of the source.

(3.) Make, or cause to be made, any physical radiation surveys required by this Article.

(4.) Maintain the following records for three years for Department review:

(a.) Results of any physical survey or calibration required by this Article;

- (b.) Radiation source inventories;
- (c.) Maintenance, service, and modification records; and

(d.) Incident reports of known or suspected exposure to nonionizing radiation that exceeds any MPE specified in this Article.

Section 7. Show Notice Requirements

(Required for Laser Light Show registrations only)

WHAT TO INCLUDE IN THIS SECTION

Maintain a chronological record of all Show Notices submitted to the Department dating back three (3) years.

How and When to Submit a Show Notice:

Submit the BRC Show Notice Form at least three (3) working days before a proposed laser light show or demonstration. The submission must be complete and include all required attachments or the show will not be approved.

Form located at AZDHS.GOV/NONION under NONIONIZING FORMS

Submit via email to NONION@AZDHS.GOV

Arizona Bureau of Radiation Control

Directions: Complete this form entirely and submit before a proposed laser light show or demonstratio activity will be returned to you and the show will no	n. If the submission is incom	plete, the applicatio	n for the proposed			
Section 1. Registration/Contact Information						
Registration Number	Or Or Part of Application for NEW Registration					
Company Name						
Street Address						
City, State, Zip						
Contact Name, Email & Phone						
Section 2. Proposed Activity Details	-					
Location Address(s)	Date(s)	Time(s)	Indoor (I) or Outdoor (O)			
Vou may attach addition	allocations datas and tim	as if paadad				
Section 2. GENERAL Show Notice Details	al locations, dates, and tim	es if needed*				
The following attachments are included with this form:						
 Food and Drug Administration (FDA) Notice of Variance from 21 CFR 1040.11(c). 						
 Sketches or diagrams showing the locations of each laser, operator, performer, laser beam path, viewing 						
screen, wall, mirror, or any other reflective or diffuse surface that could be hit by or reflect the laser beam.						
Scanning beam patters, scan velocity, and frequency in occupied areas.						
Physical surveys and calculations made to comply with Arizona Administrative Code, Title 9, Chapter 7,						
Article 14: Registration for and Standards for Protection Against Nonionizing Radiation.						
Any additional information the Department may need to evaluate the safety of the proposed activity.						
Section 3. SPECIFIC Show Notice Details						
If you selected OUTDOOR for any shows in 'Section 2." attach the following with your submission:						
 No outdoor shows will occur. All outdoor loops hopmen will be termineted in non-newigeble sizes on No. 50.0 netification required 						
 All outdoor laser beams will be terminated in non-navigable airspace. No FAA notification required. Outdoor laser beams will not be terminated. Endered Aviation Administration (EAA) Nation of 						
 Outdoor laser beams will not be terminated. Federal Aviation Administration (FAA) Notice of Aeronautical Review indicating no objections to the proposed activity attached. 						
If you will be performing any AUDIENCE SCANNING, acknowledge the following:						
 No audience scanning will occur. 						
 A device will not be used which, as a result of scan failure or any other failure, can change its angular 						
velocity or amplitude, permitting audience exposure to laser radiation that exceeds the applicable Class 1						
accessible emission limit.						
Section 4. Registration Representative Submitting	g this Form					
Full Name & Title (Print)						
Date						

Section 8. What to Expect During an Inspection

WHAT TO INCLUDE IN THIS SECTION

No documentation requirements.

HOW TO USE THIS SECTION

Provided within is the inspection template which serves as both an outline of what to expect to be audited as well as a method of conducting internal audits for maintaining compliance between State inspections, ideally preventing violations. Each item on the template is accompanied by its corresponding A.A.C. R9-7 regulation, for reference.

Highlight Regulation References:

- FDA Laser Notices
 - Laser Illuminated Projectors (LIP) that are classified as Risk Group 3 (RG3) are equivalent to Laser Classes III-b or IV and regulated as such. [FDA Laser Notice 57; IV(d)]
- FAA Air Traffic Organization Policies
 - FAA notification not required for laser operations that are terminated and do not enter navigable airspace [FAA Order: JO 7400.2M; Part 6, Chapter 29, Section 1]

Section 9. Department Correspondence

WHAT TO INCLUDE IN THIS SECTION

File any correspondence with the Department in this section.

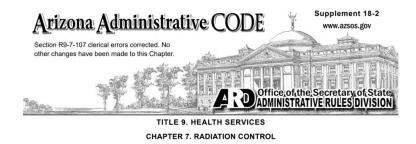
Examples of Department Correspondence include:

- Any forms, applications, etc..., that you submit to our office
- Any notices we send you
- Notice of Preliminary Findings
- Notice of Violation
- Notice of Compliance
- Deficiency Notices
- Courtesy Renewal, Amendment, etc.., Reminders
- Etc...

Section 10. Nonionizing Rules

Available online at:

https://apps.azsos.gov/public services/Title 09/9-07.pdf



As a registrant in possession of any radiation source, both material and machine, you are subject to any and all applicable regulations within the Arizona Administrative Code, Title 9, Chapter 7. Visit the Rules tab of our website to access "A.A.C. Title 9, Chapter 7" to view the full chapter.

As a guidance for nonionizing registrants, identified below are the broad sections of 9 A.A.C. 7 Article 14, Registration of Nonionizing Radiation Sources and Standards for Protection Against Nonionizing Radiation:

- 1401: Registration
- 1402: Definitions
- 1403: General Safety Provisions
- 1404-1410: Radiofrequency (RF), and RF Incidents
- 1412-1416: Ultraviolet Tanning (UV), and UV Incidents
- 1421-1436: Laser Safety, and Laser Incidents
- 1437: Special Lasers
- 1438-1438.01: Cosmetic Use Lasers (also subject to 1440)
- 1439: Laser and IPL Training Programs
- 1440: Medical Use Lasers
- 1441: Laser Light Show Demonstrations
- 1442-1444: Laser MPE, Measurement Instrumentation, and Classification Measurements
- Appendix C: Subjects taught by a Laser and IPL Training Program
- Appendix D: Subjects taught by a Laser Safety Officer (LSO) Training Course

Appendix D: Laser Safety officer Training Curriculum

9. A.A.C. 7. Article 14, Appendix D

(1.) Operators and personnel that work around lasers:

(a.) Fundamentals of laser operation (for example: physical principles, construction, and other basic information)

(b.) Bioeffects of laser radiation on the eye and skin

(c.) Significance of specular and diffuse reflections

(d.) Non-beam hazards of lasers (for example: electrical, chemical, and reaction byproducts)

(e.) Ionizing radiation hazards (includes information regarding x-rays from power sources and target interactions, if applicable)

(f.) Laser and laser system classifications

(g.) Control measures

(h.) Responsibilities of managers and operators

(i.) Medical surveillance practices (if applicable)

(j.) CPR for personnel servicing lasers with exposed high voltages, the capability of producing potentially lethal electrical currents, or both.

(2.) The LSO or other individual responsible for the safety program, evaluation of hazards, and implementation of control measures, or any others, if directed by management to obtain a thorough knowledge of laser safety:

(a.) The subjects covered in subsection (1)

(b.) Laser terminology

(c.) Laser types, wavelengths, pulse shapes, modes, power and energy

(d.) Basic radiometric units and measurement devices

(e.) MPE levels for eye and skin under all conditions

(f.) Laser hazard evaluations, range equations, and other calculations

(3.) Technical Considerations

(a.) Laser and IPL device descriptions

(b.) Definitions

(c.) Laser and IPL device radiation fundamentals

(d.) Laser mediums, types of lasers, and other light-emitting devices (includes information regarding diodes and solid, liquid, gas, and IPL devices)

(e.) Biological effects of laser or IPL device light

(f.) Damage mechanisms

(i.) Eye hazard

(ii.) Skin hazard (includes information regarding skin type and skin anatomy)

(iii.) Absorption and wavelength effects

(iv.) Thermal effects

(g.) Photo chemistry

(h.) Photosensitive medications

(i.) Criteria for setting the Maximum Permissible Exposure (MPE) levels for eye and skin associated hazards

(j.) Explosive, electrical, and chemical hazards

(k.) Fire, ionizing radiation, cryogenic hazards, and other hazards as applicable.