

**NOTICE OF PROPOSED RULEMAKING**

**TITLE 12. NATURAL RESOURCES**

**CHAPTER 1. RADIATION REGULATORY AGENCY**

**PREAMBLE**

| <b><u>1.</u></b> | <b><u>Sections Affected</u></b> | <b><u>Rulemaking Action</u></b> |
|------------------|---------------------------------|---------------------------------|
|                  | R12-1-102                       | Amend                           |
|                  | R12-1-303                       | Amend                           |
|                  | R12-1-305                       | Amend                           |
|                  | R12-1-306                       | Amend                           |
|                  | R12-1-310                       | Amend                           |
|                  | R12-1-320                       | Amend                           |
|                  | R12-1-710                       | Amend                           |
|                  | R12-1-10 Exhibit A.             | Amend                           |
|                  | R12-1-1501                      | Amend                           |
|                  | R12-1-1509                      | Amend                           |
|                  | R12-1-1510                      | Amend                           |
|                  | R12-1-1513                      | Amend                           |

**2. Citations to the agency’s statutory rulemaking authority to include the authorizing statute (general) and the implementing statute (specific):**

Authorizing statute:

A.R.S. § 30-654(B)(5)

Implementing statutes:

A.R.S. §§ 30-651, 30-654, 30-657, 30-671(B), 30-672, 30-673, 30-681, 30-687, 30-688, and 30-689.

**3. Citations to all related notices published in the Register as specified in R1-1-409(A)**

**that pertain to the record of the proposed rule:**

*Notice of Rulemaking Docket Opening: Upon approval for moratorium over-ride*

**4. The agency's contact person who can answer questions about the rulemaking:**

Name: Jerry W. Perkins

Address: Arizona Radiation Regulatory Agency

4814 South 40th Street

Phoenix, Arizona 85040

Telephone: (602) 255-4845 ext. 272

Fax: (602) 437-0705

E-mail: [jperkins@azrra.gov](mailto:jperkins@azrra.gov)

Website: [www.azrra.gov](http://www.azrra.gov)

**5. An agency's justification and reason why a rule should be made, amended, repealed or renumbered, to include an explanation about the rulemaking:**

This rulemaking package amends and adds several rules to ensure that Arizona radiation

compliance remains compatible with the Nuclear Regulatory Commission regulations. This compatibility is a requirement under Arizona's agreement state status.

**6. A reference to any study relevant to the rule that the agency reviewed and proposes either to rely on or not to rely on in its evaluation of or justification for the rule, where the public may obtain or review each study, all data underlying each study, and any analysis of each study and other supporting material:**

None

**7. A showing of good cause why the rulemaking is necessary to promote a statewide interest if the rulemaking will diminish a previous grant of authority of a political subdivision of this state:**

Not applicable

**8. The preliminary summary of the economic, small business, and consumer impact:**

There is little or minimal economic impact from any of the proposed rules in this rulemaking. Currently all licensees and registrants pay an annual fee which covers the administrative cost and inspection fees for the re facility number. This package has no fee increase or new requirements that would markedly change the way business operate with radiation safety concerns in mind. The amendments in this rulemaking catch Arizona up with federal regulations in accordance with the Agreement State document signed by the state Governor on May 21, 1963.

**9. The agency's contact person who can answer questions about the economic, small business and consumer impact statement:**

Name: Jerry W. Perkins

Address: Arizona Radiation Regulatory Agency  
4814 South 40th Street  
Phoenix, Arizona 85040  
Telephone: (602) 255-4845 ext. 272  
Fax: (602) 437-0705  
E-mail: jperkins@azrra.gov  
Website: www.azrra.gov

**10. The time, place, and nature of the proceedings to make, amend, repeal, or renumber the rule, or if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:**

An oral proceeding at the Agency will be scheduled for 9:00 am on March 2, 2012 at 4814 South 40th Street, Phoenix, Arizona. A person may also submit written comments concerning the proposed rules by submitting them no later than 5:00 pm March 2<sup>nd</sup>, 2012, to the following person:

Name: Aubrey V. Godwin, Director  
Location: Arizona Radiation Regulatory Agency  
Address: Arizona Radiation Regulatory Agency  
4814 South 40th Street  
Phoenix, Arizona 85040  
Telephone: (602) 255-4845  
Fax: (602) 437-0705.

**11. All agencies shall list other matters prescribed by statute applicable to the specific agency or to any specific rule or class of rules. Additionally, an agency subject to Council review under A.R.S. §§ 41-1052 and 41-1055 shall respond to the following questions:**

**a. Whether the rule requires a permit, whether a general permit is used and if not, the reasons why a general permit is not used:**

The rules refer to permits both general and specific. The general permit applies to exempt levels of radioactive material, and specific permits are issued by rule for quantities and uses that are specific to the user and their training or scope of practice.

**b. Whether a federal law is applicable to the subject of the rule, whether the rule is more stringent than federal law and if so, citation to the statutory authority to exceed the requirements of federal law:**

The rule amendments are compatible with existing federal regulations and are not more stringent.

**c. Whether a person submitted an analysis to the agency that compares the rule's impact of the competitiveness of business in this state to the impact on business in other states:**

No analysis has been completed as the regulated community must be in compliance with either federal regulations (if not under a state jurisdiction) or agreement state rules.

**12. A list of any incorporated by reference material as specified in A.R.S. § 41-1028 and**

**its location in the rules:**

| <b><u>Rule</u></b>          | <b><u>Incorporated Material</u></b> |
|-----------------------------|-------------------------------------|
| R12-1-102                   |                                     |
| “Certificate of Compliance” | 10 CFR 71                           |
| R12-1-306 (B)(1)            | 10 CFR 31.5(b), (c), and (d)        |
| R12-1-306 (B)(4)(g)         | 10 CFR 110                          |
| R12-1-306 (D)(1)            | 10 CFR 32.57 or 10 CFR 70.39        |
| R12-1-306 (E)(3)            | 10 CFR 32                           |
| R12-1-1509 (A)              | 49 CFR 173.417(a)                   |
| R12-1-1510 (A)(6)(c)        | 10 CFR 71.22                        |
| R12-1-1510 (B)(1)(a)        | 10 CFR 71.85(c)                     |
| R12-1-1510 (B)(1)(b)        | 49 CFR 173.403                      |
| R12-1-1510 (B)(2)(a)        | 10 CFR 71.85(c)                     |
| R12-1-1510 (B)(2)(b)        | 49 CFR 173.403                      |
| R12-1-1510 (B)(3)(a)        | 10 CFR 71.71 and 71.73              |
| R12-1-1510 (B)(3)(b)        | 10 CFR 71.71 and 71.73              |
| R12-1-1510 (B)(5)           | 10 CFR 71.4                         |

|                          |                                 |
|--------------------------|---------------------------------|
| R12-1-1510 (C)           | 49 CFR 173 and 178              |
| R12-1-1510 (C)(2)(b)     | 10 CFR 71, Subparts A, G, and H |
| R12-1-1510 (C)(3)        | 49 CFR 173.403                  |
| R12-1-1510 (D)(1)        | 49 CFR 171.12                   |
| R12-1-1510 (D)(3)(b)(ii) | 10 CFR 71, Subparts A, G, and H |
| R12-1-1510 (E)(8)        | 10 CFR 71.45                    |
| R12-1-1510 (E)(9)        | 49 CFR 173.443                  |
| R12-1-1510 (10)          | 10 CFR 71.47                    |
| R12-1-1510 (11)          | 10 CFR 71.43(g)                 |
| R12-1-1513               | 10 CFR 20.1906(e)               |

**13. The full text of the rules follows:**

## ARTICLE 1. GENERAL PROVISIONS

### R12-1-102 Definitions

Terms defined in A.R.S. § 30-651 have the same meanings when used in this Chapter unless the context otherwise requires.

Additional subject-specific definitions are used in other Articles.

|                                 |           |
|---------------------------------|-----------|
| “A <sub>1</sub> ”               | No change |
| “A <sub>2</sub> ”               | No change |
| “Absorbed dose”                 | No change |
| “Accelerator”                   | No change |
| “Accelerator produced material” | No change |
| “Act”                           | No change |
| “Activity”                      | No change |
| “Adult”                         | No change |
| “Agency” or “ARRA”              | No change |
| “Agreement State”               | No change |
| “Airborne radioactive material” | No change |
| “Airborne radioactivity area”   | No change |
| “ALARA”                         | No change |
| “Analytical x-ray equipment”    | No change |
| “Analytical x-ray system”       | No change |
| “Annual”                        | No change |
| “Background radiation”          | No change |

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| “Becquerel”   | No change |
| “Bioassay”  | No change |
| “Brachytherapy”   | No change |
| “By-product material”   | No change |
| “Calendar quarter”  | No change |
| “Calibration”   | No change |
| “Certifiable cabinet x-ray system”  | No change |
| “Certified cabinet x-ray system”  | No change |
| <u>“Certificate holder” means a person who has been issued a certificate of compliance or other package approval by the Agency or NRC.</u>  |           |
| <u>“Certificate of Compliance” (CoC) means the certificate issued by the Commission under subpart D of 10 CFR 71, (revised January 1, 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments), which approves the design of a package for the transportation of radioactive material.</u> |           |
| “CFR”   | No change |
| “Chelating agent”   | No change |
| “Civil penalty”   | No change |
| “Collective dose”   | No change |
| “Committed dose equivalent”   | No change |
| “Committed effective dose equivalent”   | No change |
| “Curie”   | No change |
| “Current license or registration”   | No change |

|                              |           |
|------------------------------|-----------|
| “Deep-dose equivalent”       | No change |
| “Depleted uranium”           | No change |
| “Dose”                       | No change |
| “Dose equivalent”            | No change |
| “Dose limits”                | No change |
| “Dosimeter”                  | No change |
| “Effective dose equivalent”  | No change |
| “Effluent release”           | No change |
| “Embryo/fetus”               | No change |
| “Enclosed beam x-ray system” | No change |
| “Enclosed radiography”       | No change |
| “Cabinet radiography”        | No change |
| “Shielded room radiography”  | No change |
| “Entrance or access point”   | No change |
| “Exhibit”                    | No change |
| “Explosive material”         | No change |
| “Exposure”                   | No change |
| “Exposure rate”              | No change |
| “External dose”              | No change |
| “Extremity”                  | No change |
| “Fail-safe characteristics”  | No change |
| “Field radiography”          | No change |

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| “Field station”  | No change |
| “Former U.S. Atomic Energy Commission (AEC)<br>or U.S. Nuclear Regulatory Commission (NRC)<br>licensed facilities” | No change |
| “Generally applicable environmental radiation standards”   | No change |
| “Gray”   | No change |
| “Hazardous waste”  | No change |
| “Healing arts”   | No change |
| “Health care institution”  | No change |
| “High radiation area”  | No change |
| “Human use”  | No change |
| “Impound”  | No change |
| “Individual”   | No change |
| “Individual monitoring”  | No change |
| “Individual monitoring device”   | No change |
| “Individual monitoring equipment”  | No change |
| “Industrial radiography”   | No change |
| “Injection tool”   | No change |
| “Inspection”   | No change |
| “Interlock”  | No change |
| “Internal dose”  | No change |
| “Irradiate”  | No change |

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| “Laser”  | No change |
| “Lens dose equivalent”                                       | No change |
| “License”  | No change |
| “Licensed material”  | No change |
| “Licensed practitioner”                                      | No change |
| “Licensee”   | No change |
| “Licensing State”  | No change |
| “Limits”   | No change |
| “Local components”   | No change |
| “Logging supervisor”   | No change |
| “Logging tool”   | No change |
| “Lost or missing licensed or registered source of radiation” | No change |
| “Low-level waste”  | No change |
| “Major processor”  | No change |
| “Medical dose”   | No change |
| “Member of the public”                                       | No change |
| “MeV”  | No change |
| “Mineral logging”  | No change |
| “Minor”  | No change |
| “Monitoring”   | No change |
| “Multiplier”   | No change |

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|---------------------------------------|-----------|
| “NARM”                                | No change |
| “Normal operating procedures”         | No change |
| “Natural radioactivity”               | No change |
| “NRC”                                 | No change |
| “Nuclear waste”                       | No change |
| “Occupational dose”                   | No change |
| “Open beam system”                    | No change |
| “Package”                             | No change |
| “Particle accelerator”                | No change |
| “Permanent radiographic installation” | No change |
| “Personnel dosimeter”                 | No change |
| “Personnel monitoring equipment”      | No change |
| “Personal supervision”                | No change |
| “Pharmacist”                          | No change |
| “Physician”                           | No change |

“Preceptor” means an individual who provides, directs, or verifies training and experience required for an individual to become an authorized user, an authorized medical physicist, an authorized nuclear pharmacist, or a Radiation Safety Officer.

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| “Primary beam”      | No change |
| “Public dose”       | No change |
| “Pyrophoric liquid” | No change |
| “Pyrophoric solid”  | No change |

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|---------------------|-----------|
| “Qualified expert”  | No change |
| “Quality Factor”    | No change |
| “Quarter”           | No change |
| “Rad”               | No change |
| “Radiation”         | No change |
| “Radiation area”    | No change |
| “Radiation dose”    | No change |
| “Radiation machine” | No change |

“Radiation safety officer” (RSO) means the individual and who for license conditions:  
Meets the requirements in 10 35.50(a) or (c)(1) and 35.59, revised January 1, 2010, incorporated  
by reference, and available under R12-1-101. This incorporated material contains no future  
editions or amendments; or is identified as a Radiation Safety Officer on a specific medical use  
license issued by the NRC or an Agreement State; or a medical use permit issued by a NRC  
master material licensee.

Or, who for registration conditions is designated by the ~~licensee~~ or registrant as the individual  
who has the knowledge, authority, and responsibility to apply appropriate radiation protection  
principles to ensure radiation safety and compliance with the Act, this Chapter and any ~~license,~~  
~~or~~ registration conditions.

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| “Radioactive marker”   | No change |
| “Radioactive material” | No change |
| “Radioactivity”        | No change |
| “Radiographer”         | No change |

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| “Radiographer's assistant”                             | No change |
| “Registrant”   | No change |
| “Registration”   | No change |
| “Regulations of the U.S. Department of Transportation” | No change |
| “Rem”  | No change |
| “Research and Development”                             | No change |
| “Restricted area”                                      | No change |
| “Roentgen”   | No change |
| “Safety system”  | No change |
| “Sealed source”  | No change |
| “Sealed Source and Device Registry”                    | No change |
| “Shallow-dose equivalent”                              | No change |
| “Shielded position”                                    | No change |
| “Sievert”  | No change |
| “Site boundary”  | No change |
| “Source changer”                                       | No change |
| “Source holder”  | No change |
| “Source material”                                      | No change |
| “Source material milling”                              | No change |
| “Source of radiation” or “source”                      | No change |
| “Special form radioactive material”                    | No change |
| “Special nuclear material in quantities not sufficient |           |

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| to form a critical mass”                 | No change |
| “Storage area”                           | No change |
| “Storage container”                      | No change |
| “Subsurface tracer study”                | No change |
| “Survey”                                 | No change |
| “TEDE”                                   | No change |
| “Teletherapy”                            | No change |
| “Temporary job site”                     | No change |
| “Test”                                   | No change |
| “These rules”                            | No change |
| “Total Effective Dose Equivalent” (TEDE) | No change |
| “Total Organ Dose Equivalent” (TODE)     | No change |
| “Unrefined and unprocessed ore”          | No change |
| “Unrestricted area”                      | No change |
| “U.S. Department of Energy”              | No change |
| “Very high radiation area”               | No change |
| “Waste”                                  | No change |
| “Waste handling licensees”               | No change |
| “Week”                                   | No change |
| “Well-bore”                              | No change |
| “Well-logging”                           | No change |
| “Whole body”                             | No change |

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|------------------------------|-----------|
| “Wireline”                   | No change |
| “Wireline service operation” | No change |
| “Worker”                     | No change |
| “WL”                         | No change |
| “WLM”                        | No change |
| “Workload”                   | No change |
| “Year”                       | No change |

### **ARTICLE 3. RADIOACTIVE MATERIAL LICENSING**

#### **R12-1-303. Radioactive Material Other Than Source Material; Exemptions**

##### A. Exempt concentrations

1. Except as provided in subsection (A)(2), any person is exempt from this Article if the person receives, possesses, uses, transfers, owns, or acquires products or materials containing radioactive material in concentrations not in excess of those listed in Exhibit A.
2. This section shall not be deemed to authorize the import of byproduct material or products containing byproduct material.
3. A manufacturer, processor, or producer of a product or material is exempt from the requirements for a license issued under R12-1-311(A) or of this Article to the extent that this person transfers byproduct material contained in a product or material in concentrations not in excess of those specified in Exhibit B of this Article and introduced into the product or material by a licensee holding a specific

license issued by the Commission expressly authorizing such introduction. This exemption does not apply to the transfer of byproduct material contained in any food, beverage, cosmetic, drug, or other commodity or product designed for ingestion or inhalation by, or application to, a human being.

~~2.4.~~ A person shall not introduce radioactive material into a product or material knowing or having reason to believe that it will be transferred to persons exempt under subsection (A)(1) or equivalent Regulations of the U.S. Nuclear Regulatory Commission or any Agreement State or Licensing State, except in accordance with ~~a general license prescribed in R12-1-320.~~ a license issued under 10 CFR 30.14 or 32.13

#### B. Exempt items

1. Except for persons who apply radioactive material to, or persons who incorporate radioactive material into the following products, or persons who initially transfer for sale or distribution the following products, a person is exempt from this Chapter to the extent that the person receives, possesses, uses, transfers, owns, or acquires the following products:
  - a. Timepieces, hands, or dials containing not more than the following specified quantities of radioactive material and not exceeding the following specified levels of radiation:
    - i. ~~925 MBq~~ megabecquerels (25 millicuries) of tritium per timepiece,
    - ii. ~~185 MBq~~ megabecquerels (5 millicuries) of tritium per hand,

- iii. 555 ~~MBq megabecquerels~~ (15 millicuries) of tritium per dial (bezels are considered part of the dial),
- iv. 3.7 ~~MBq megabecquerels~~ (100 microcuries) of promethium-147 per watch or 7.4 ~~MBq megabecquerels~~ (200 microcuries) of promethium-147 per any other timepiece,
- v. 740 kBq (20 microcuries) of promethium-147 per watch hand or 1.48 ~~MBq megabecquerels~~ (40 microcuries) of promethium-147 per other timepiece hand,
- vi. ~~2.22 MBq megabecquerels~~ (60 microcuries) of promethium-147 per watch dial or 4.44 ~~MBq megabecquerels~~ (120 microcuries) of promethium-147 per other timepiece dial (bezels are considered part of the dial),
- vii. The levels of radiation from hands and dials containing promethium-147 shall not exceed, when measured through 50 milligrams per square centimeter of absorber:
  - (1) For wrist watches, 1.0  $\mu$ Gy (0.1 millirad) per hour at 10 centimeters from any surface of the watch,
  - (2) For pocket watches, (0.1 millirad) per hour at 1 centimeter from any surface,
  - (3) For any other timepiece, 2.0  $\mu$ Gy (0.2 millirad) per hour at 10 centimeters from any surface,
- viii. 37 kBq (1 microcurie) of radium-226 in time pieces manufactured prior to October 1, 1978;
- b. ~~Lock illuminators containing not more than 555 MBq megabecquerels (15 millicuries) of tritium or not more than 74 MBq megabecquerels (2 millicuries) of promethium-147 installed in automobile locks. The levels of radiation from each~~

- ~~lock illuminator containing promethium-147 shall not exceed 10  $\mu$ Gy (1 millirad) per hour at 1 centimeter from any surface when measured through 50 milligrams per square centimeter of absorber;~~
- e.b. Balances of precision containing not more than 37 ~~MBq~~ megabecquerels (1 millicurie) of tritium per balance or not more than 18.5 megabecquerels (0.5 millicurie) of tritium per balance part manufactured before December 17, 2007;
- d. ~~Automobile shift quadrants containing not more than 925 MBq~~ megabecquerels (25 millicuries) of tritium;
- e.c. Marine compasses containing not more than 27.75 GBq (750 millicuries) of tritium gas and other marine navigational instruments containing not more than 9.25 GBq (250 millicuries) of tritium gas;
- f. ~~Thermostat dials and pointers containing not more than 925 MBq~~ megabecquerels (25 millicuries) of tritium per thermostat;
- ~~g.d.~~ Electron tubes: Provided that each tube does not contain more than one of the following specified quantities of radioactive material:
- i. 5.55 GBq (150 millicuries) of tritium per microwave receiver protector tube or 370 ~~MBq~~ megabecquerels (10 millicuries) of tritium per any other electron tube;
  - ii. 37 kBq (1 microcurie) of cobalt 60;
  - iii. 185 kBq (5 microcuries) of nickel 63;
  - iv. 1.11 ~~MBq~~ megabecquerels (30 microcuries) of krypton 85;
  - v. 185 kBq (5 microcuries) of cesium 137;
  - vi. 1.11 ~~MBq~~ megabecquerels (30 microcuries) of promethium-147;

And provided further, that the level of radiation due to radioactive material contained in each electron tube does not exceed 10  $\mu\text{Gy}$  (1 millirad) per hour) at 1 centimeter from any surface when measured through 7 milligrams per square centimeter of absorber. The term "electron tubes" includes spark gap tubes, power tubes, gas tubes, including glow lamps, receiving tubes, microwave tubes, indicator tubes, pick-up tubes, radiation detection tubes, and any other completely sealed tube that is designed to conduct or control electrical current.

~~h.e.~~ Ionizing radiation measuring instruments containing, for purposes of internal calibration or standardization, one or more sources of radioactive material provided that:

- i. Each source contains no more than one exempt quantity set forth in Exhibit B of this Article, and
- ii. Each instrument contains no more than 10 exempt quantities. For the purposes of this subsection, an instrument's source or sources may contain either one type or different types of radionuclide and an individual exempt quantity may be composed of fractional parts of one or more of the exempt quantities in Exhibit B of this Article, provided the sum of the fractions do not exceed unity.
- iii. For the purposes of subsection (B)(1)(h) only, 185 kBq (50 nanocurie) of americium-241 is considered an exempt quantity under Exhibit B of this Article.
- ~~iv. Spark gap irradiators containing not more than 37 kBq (1 microcurie) of cobalt-60 per spark gap irradiator for use in electrically ignited fuel oil burners having a firing rate of at least 3 gallons per hour (11.4 liters/hr or 0.0114 m<sup>3</sup>/hr).~~

f. Ionization chamber smoke detectors containing not more than 1 microcurie

([micro]Ci) of americium-241 per detector in the form of a foil and designed to protect life and property from fires.

~~2. Resins containing scandium 46 and designed for sand consolidation in oil wells. A person is exempt from this Chapter if the person receives, possesses, uses, transfers, owns, or acquires synthetic plastic resins containing scandium 46 which are designed for sand consolidation in oil wells. The described resins shall be manufactured, initially transferred for sale or distribution, or imported according to a specific license issued by the U.S. Nuclear Regulatory Commission, or shall be manufactured according to the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of the described resins according to licensing requirements equivalent to those in 10 CFR 32.16 of the U.S. Nuclear Regulatory Commission. This exemption does not authorize the manufacture, or initially transferred for sale or distribution, of any resins containing scandium 46.~~

~~3.5. Self-luminous products~~

a. Except for persons who manufacture, process, initially transferred for sale or distribution, or produce self-luminous products containing tritium, krypton-85, or promethium-147, a person is exempt from this Chapter if the person receives, possesses, uses, owns, transfers or acquires tritium, krypton-85 or promethium-147 in self-luminous products manufactured, processed, produced, initially transferred for sale or distribution, imported, or transferred under a specific

license issued by the U.S. Nuclear Regulatory Commission and described in 10 CFR 32.22, and the license authorizes the transfer of the products to persons who are exempt from regulatory requirements. This exemption does not apply to tritium, krypton-85, or promethium-147 used in products for frivolous purposes or in toys or adornments.

- b. A person is exempt from this Chapter if the person receives, possesses, uses, or transfers articles containing less than 3.7 kBq (100 nanocuries) of radium-226, manufactured prior to October 1, 1978.

#### 4.6. Gas and aerosol detectors containing radioactive material

- a. Except for persons who manufacture, process, initially transferred for sale or distribution, or produce gas and aerosol detectors containing radioactive material, a person is exempt from this Chapter if the person receives, possesses, uses, transfers, owns, or acquires radioactive material in gas and aerosol detectors designed to protect life or property from fires and airborne hazards, provided that detectors containing radioactive material shall be manufactured, imported, or transferred according to a specific license issued by the U.S. Nuclear Regulatory Commission and described in 10 CFR 32.26, or equivalent regulations of an Agreement or Licensing State, and the license authorizes the transfer of the detectors to persons who are exempt from regulatory requirements.
- b. Gas and aerosol detectors previously manufactured and distributed to general licensees in accordance with a specific license issued by an Agreement State are exempt under subsection (B)(4)(a), provided that the device is labeled in accordance with

the specific license authorizing distribution of the general licensed device, and that the detectors meet the requirements of the regulations of the U.S. Nuclear Regulatory Commission.

### C. Exempt quantities

1. Except as provided in subsections (C)(2) and (3), a person is exempt from this Chapter if the person receives, possesses, uses, owns transfers or acquires radioactive material in individual quantities each of which does not exceed the applicable quantity set forth in Exhibit B of this Article.
2. This subsection does not authorize the production, packaging, or repackaging or transfer of radioactive material for purposes of commercial distribution, or the incorporation of radioactive material into products intended for commercial distribution.
3. Except as specified in this subsection, a person shall not, for purposes of commercial distribution, transfer radioactive material in the individual quantities set forth in Exhibit B of this Article, knowing or having reason to believe the described quantities of radioactive material will be transferred to persons exempt under subsection (C) or equivalent Regulations of the U.S. Nuclear Regulatory Commission or any Agreement State or Licensing State. A person may transfer radioactive material for commercial distribution under a specific license issued by the U.S. Nuclear Regulatory Commission under 10 CFR 32.18 which license states that the radioactive material may be transferred by the licensee to persons

exempt under this subsection or the equivalent regulations of the U.S. Nuclear Regulatory Commission or any Agreement State or Licensing State.

4. Sources containing exempt quantities of radioactive material shall not be bundled or placed in close proximity for the purpose of using the radiation from the combined sources in place of a single source, containing a licensable quantity of radioactive material.
5. Possession and use of bundled or combined sources containing exempt quantities of radioactive material in unregistered devices by persons exempt from licensing is prohibited.
6. Any person, who possesses byproduct material received or acquired before September 25, 1971, under the general license issued under R12-1-311(A) of this Article or similar general license of an Agreement State or the NRC, is exempt from the requirements for a license issued under R12-1-311(A) of this Article to the extent that this person possesses, uses, transfers, or owns byproduct material.
7. No person may, for purposes of producing an increased radiation level, combine quantities of byproduct material covered by this exemption so that the aggregate quantity exceeds the limits set forth in Sec. 30.71, Schedule B, except for byproduct material combined within a device placed in use before May 3, 1999, or as otherwise permitted by the regulations in this part.

**R12-1-305. General Licenses - Source Material**

A. This subsection grants a general license that authorizes ~~a person such as~~ commercial and industrial firms; research, educational, and medical institutions; and state and local government agencies to use, and transfer not more than 6.8 kg (15 pounds) of source material at any one time for research, development, educational, commercial, or operational purposes. A person authorized under this subsection shall not receive more than 68.2 kg (150 pounds) of source material in one calendar year.

B. No change

C. No change

1. No change

2. No change

3. No change

D. No change

1. No change

2. No change

3. No change

4. No change

5. No change

E. No change

**R12-1-306. General License - Radioactive Material Other Than Source Material**

A. This subsection grants a general license that authorizes ~~a person such as~~ a commercial or industrial firm, to transfer, receive, acquire, own, possess, and use radioactive material

incorporated in the following devices or equipment manufactured, tested, and labeled by the manufacturer in accordance with a specific license issued to the manufacturer by the U.S. Nuclear Regulatory Commission under 10 CFR 31.3. The devices regulated by this subsection include:

1. No change
2. No change

B. Certain detecting, measuring, gauging or controlling devices.

1. This subsection grants a general license that authorizes ~~a person such as~~ a commercial or industrial firm; a research, educational or medical institution; an individual conducting business; or a state or local government agency to receive, acquire, possess, use, or transfer radioactive material according to the provisions of 10 CFR 31.5(b), (c), and (d), revised January 1, ~~2008~~, 2010, incorporated by reference, and available under R12-1-101. The incorporated material contains no future editions or amendments; byproduct material contained in devices designed and manufactured for the purpose of detecting, measuring, gauging or controlling thickness, density, level, interface location, radiation, leakage, or qualitative or quantitative chemical composition, or for producing light or an ionized atmosphere.
2. No change
3. No change
  - a. No change
  - b. No change

4. No change
  - a. No change
  - b. No change
    - i. No change
    - ii. No change
  - c. No change
    - i. No change
    - ii. No change
  - d. No change
  - e. No change
    - i. No change.
    - ii. No change
    - iii. No change
  - f. No change
  - g. Not export a device that contains radioactive material except in accordance with 10 CFR 110, ~~January 1, 2005, which is incorporated by reference, published by the Office of the Federal Register National Archives and Records Administration, Washington, D.C. 20408, and on file with the Agency. The material incorporated by reference contains no future editions or amendments.~~ revised January 1, 2010, incorporated by reference, and available under R12-1-101. The incorporated material contains no future editions or amendments.

- h. No change
  - i. No change
  - j. No change
  - k. No change
  - l. No change
  - m. No change
  - n. No change
  - o. No change
  - p. No change
  - q. No change
  - r. No change
  - s. No change
- 5. No change
  - 6. No change
  - 7. The general license in subsection (B)(1) of this section does not authorize the manufacture or import of devices containing byproduct material.

C. No change

- 1. No change
- 2. No change

D. No change

- 1. This subsection grants a general license for calibration or reference sources that have been manufactured according to the specifications contained in a specific license

issued to the manufacturer or importer of the sources by the U.S. Nuclear Regulatory Commission under 10 CFR 32.57 or 10 CFR 70.39. This general license also governs calibration or reference sources that have been manufactured according to specifications contained in a specific license issued to the manufacturer by the Agency, an Agreement State, or a Licensing State, according to licensing requirements equivalent to those contained in 10 CFR 32.57 or 10 CFR 70.39, ~~as applicable, January 1, 2004, which are incorporated by reference, published by the Office of the Federal Register, National Archives and Records Administration, Washington D.C. 20408, and on file with the Agency. The material incorporated by reference contains no future editions or amendments.~~ revised January 1, 2010, incorporated by reference, and available under R12-1-101. The incorporated material contains no future editions or amendments.

2. No change
3. No change
4. No change

E. This subsection grants a general license that authorizes a person to receive, possess, use, transfer, own, or acquire carbon-14 urea capsules, which contain one microcurie of carbon-14 urea for ~~in vivo~~ "in vivo" human diagnostic use.;

~~Receipt, possession, use, transfer, ownership or acquisition of carbon-14 urea capsules containing 1 microcurie of carbon-14 urea for "in vivo" human diagnostic use:~~

1. No change
2. No change

3. A physician who desires to manufacture, prepare, process, produce, package, repackage, or transfer carbon-14 urea capsules for commercial distribution shall obtain a specific license from the Agency, issued according to the requirements in 10 CFR 32, January 1, 2005, ~~which is incorporated by reference, published by the Office of the Federal Register, National Archives and Records Administration, Washington, D.C. 20408, and on file with the Agency. The material incorporated by reference contains no future editions or amendments.~~ revised January 1, 2010, incorporated by reference, and available under R12-1-101. The incorporated material contains no future editions or amendments.

4. No change

F. This subsection grants a general license that authorizes any physician, clinical laboratory, or hospital to use radioactive material for certain ~~in vitro~~ “in vitro” clinical or laboratory testing.

1. No change

a. Iodine-125, in units not exceeding 370 ~~kBq~~ kilobecquerel (10 microcuries) each for use in ~~in vitro~~ “in vitro” clinical or laboratory tests not involving internal or external administration of radioactive material, or radiation from such material, to human beings or animals.

b. Iodine-131, in units not exceeding 370 ~~kBq~~ kilobecquerel (10 microcuries) each for use in ~~in vitro~~ “in vitro” clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.

- c. Carbon-14, in units not exceeding 370 ~~kBq~~ kilobecquerel (10 microcuries) each for use in ~~in vitro~~ "in vitro" clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.
- d. Hydrogen-3 (tritium), in units not exceeding 1.85 ~~MBq~~ megabecquerel (50 microcuries) each for use in ~~in vitro~~ "in vitro" clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.
- e. Iron-59, in units not exceeding 740 ~~kBq~~ kilobecquerel (20 microcuries) each for use in ~~in vitro~~ "in vitro" clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.
- f. Cobalt-57, in units not exceeding 370 ~~kBq~~ kilobecquerel (10 microcuries) each for use in ~~in vitro~~ "in vitro" clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.
- g. Mock iodine-125 reference or calibration sources, in units not exceeding 1.85 kBq (50 nanocurie) of iodine-129 and 185 ~~Bq~~ becquerel (5 nanocurie) of americium-241 each, for use in ~~in vitro~~ "in vitro" clinical or laboratory tests not involving internal or external administration of radioactive material, or the radiation from such material, to human beings or animals.

2. A person shall not acquire, receive, possess, use, or transfer radioactive material according to the general license established by this subsection until the person has filed with the Agency ARRA-9, "Certificate -- ~~In Vitro~~ "In Vitro" Testing with Radioactive Material Under General License", provided the information listed in Exhibit E, and received a validated copy of ARRA-9, which indicates the assigned certification number. The physician, clinical laboratory, or hospital shall furnish on ARRA-9 the following information:
  - a. No change
  - b. A statement that the physician, clinical laboratory, or hospital has radiation measuring instruments to carry out ~~in vitro~~ "in vitro" clinical or laboratory tests with radioactive material and that tests will be performed only by personnel competent to use the instruments and handle the radioactive material.
3. No change
  - a. Not possess at any one time, in storage or use, a combined total of not more than 7.4 ~~MBq~~ megabecquerel (200 microcuries) of iodine-125, iodine-131, iron-59, or cobalt-57 in excess of 7.4 ~~MBq~~ megabecquerel (200 microcuries), or acquire or use in any one calendar month more than 18.5 ~~MBq~~ megabecquerel (500 microcuries) of these radionuclides.
  - b. No change
  - c. No change
  - d. No change

- e. No change
- 4. No change
- 5. No change
- 6. For the purposes of subsection (F), a licensed veterinary care facility is considered a "clinical laboratory".

G. This subsection grants a general license that authorizes a person to receive, acquire, possess, use, and transfer strontium-90, contained in ice detection devices, provided each device contains not more than 1.85 ~~MBq~~ megabecquerel (50 microcuries) of strontium-90 and each device has been manufactured or imported in accordance with a specific license issued by the U.S. Nuclear Regulatory Commission or each device has been manufactured according to the specifications contained in a specific license issued by the Agency or any Agreement State to the manufacturer of the device under licensing requirements equivalent to those in 10 CFR 32.61. A person who receives, acquires, possesses, uses, or transfers strontium-90 contained in ice detection devices under a general license in accordance with subsection (G):

- 1. No change
- 2. No change
- 3. No change
- 4. No change
- 5. No change

**R12-1-310. Special Requirements for Issuance of Specific Broad Scope Licenses**

A. The Agency shall issue three classes of academic and industrial broad scope licenses, and only a single class A medical broad scope license.

1. The license may authorize the radioactive materials in multi-curie quantities, and may authorize other radioactive materials and forms in addition to those listed in subsection (A)(1)(a). A license is a broad scope class A license if it:

- a. Contains the exact wording “Any radioactive material with Atomic Number 3 through 83” or “Any radioactive material with Atomic Number 84 through 92” in License Item 6, and
- b. Contains the word “any” to authorize the chemical or physical form of the materials in License Item 7.

~~The license may authorize the radioactive materials in multi-curie quantities, and may authorize other radioactive materials and forms in addition to those listed in subsection (A)(1)(a).~~

#### **R12-1-320. Reciprocal Recognition of Licenses**

A. This subsection grants a general license to perform specific licensed activities in Arizona for a period not to exceed 180 days in any calendar year to any person who holds a specific license from an Agreement State, where the licensee maintains an office for directing the licensed activity and retaining radiation safety records, is granted a general license to conduct the same activity ~~for~~ activity involving the use of radioactive material from the U.S. Nuclear Regulatory Commission, Licensing State, or any Agreement State, provided that:

1. The license does not limit the activity to specified installations or locations;

2. The out-of-state licensee notifies the Agency in writing at least three days before engaging in the licensed activity. The notification shall indicate the location, period, and type of proposed possession and use within the State, and be accompanied by a copy of the pertinent licensing document. If, for a specific case, the three-day period would impose an undue hardship on the out-of-state licensee, the licensee may, upon application to the Agency, obtain permission to proceed sooner. The Agency may waive the requirement for filing additional written notifications during the remainder of the calendar year, following receipt of the initial notification from a person engaging in activities under the general license provided in this Section;
3. The out-of-state licensee complies with all applicable statutes and rules of the Agency and with all the terms and conditions of the license, except those terms and conditions inconsistent with applicable statutes and rules of the Agency;
4. The out-of-state licensee supplies any other information the Agency requests; and
5. The out-of-state licensee does not transfer or dispose of radioactive material possessed or used under the general license provided in this Section except by transfer to a person:
  - a. Specifically licensed by the Agency, or by the U.S. Nuclear Regulatory Commission to receive the radioactive material; or
  - b. Exempt under R12-1-303(A).

**B.** Notwithstanding the provisions of subsection (A)(1), this subsection grants a general license to manufacture, install, transfer, demonstrate, or service a device described in R12-1- 306(B)(1)

to any person who holds a specific license issued by the U.S. Nuclear Regulatory Commission, Licensing State, or an Agreement State authorizing the same activities within areas subject to the jurisdiction of the licensing body, provided that:

1. The person files a report with the Agency within 30 days after the end of each calendar quarter in which any device is transferred to or installed in this State. Each report shall identify the general licensee to whom the device is transferred by name and address, the type of device transferred, and the quantity and type of radioactive material contained in the device;
2. The device has been manufactured, labeled, installed, and serviced according to the applicable provisions of the specific license issued to the person by the U.S. Nuclear Regulatory Commission or an Agreement State;
3. The person entering the state ensures that any labels required to be affixed to the device under rules of the authority which licensed manufacture of the device bear the following statement: "Removal of this label is prohibited"; and
4. The holder of the specific license furnishes a copy of the general license contained in R12-1-306(B), or equivalent rules of the agency having jurisdiction over the manufacture or distribution of the device, to each general licensee to whom the licensee transfers the device or on whose premises the device is installed.

**C.** The Agency may withdraw, limit, or qualify the acceptance of any specific license or equivalent licensing document issued by another agency, or any product distributed under a license, upon determining that an action is necessary to prevent undue hazard to public health and safety, or property.

**D.** Before radioactive material can be used at a temporary job site within the state at any federal facility, a specific licensee shall determine the jurisdictional status of the job site. If the jurisdictional status is unknown, the specific licensee shall contact the controlling federal agency to determine whether the job site is under exclusive federal jurisdiction.

**E.** Before using radioactive material at a job site under exclusive federal jurisdiction, a specific licensee shall:

1. Obtain authorization from the NRC; and
2. Use the radioactive material in accordance with applicable NRC regulations and orders, and be able to demonstrate to the Agency that the correct license fee was paid to the NRC.

**F.** Before radioactive material can be used at a temporary job site in another state, a specific licensee shall obtain authorization from the state, if it is an Agreement State, or from the NRC for any non-Agreement State, either by filing for reciprocity or applying for a specific license.

**R12-1-710. Radiation Safety Officer Training**

**A.** A licensee shall require an individual fulfilling the responsibilities of the radiation safety officer, described in R12-1-705, to be an individual who:

1. Is certified by a specialty board whose certification process includes all of the requirements in subsection (2) and whose certification has been recognized by the Agency, NRC, or an Agreement State. To have its certification process recognized, a specialty board shall require all candidates for certification to:
  - a. Meet the following minimum requirements:

- i. Hold a bachelor's or graduate degree from an accredited college or university in physical science or engineering or biological science with a minimum of 20 college credits in physical science;
- ii. Have 5 or more years of professional experience in health physics (graduate training may be substituted for no more than 2 years of the required experience) including at least 3 years in applied health physics; and
- iii. Pass an examination administered by diplomates of the specialty board, which evaluates knowledge and competence in radiation physics and instrumentation, radiation protection, mathematics pertaining to the use and measurement of radioactivity, radiation biology, and radiation dosimetry; or

b. Meet the following minimum requirements:

- i. Hold a master's or doctor's degree in physics, medical physics, other physical science, engineering, or applied mathematics from an accredited college or university;
- ii. Have 2 years of full-time practical training and/or supervised experience in medical physics—
  - ?i. Under the supervision of a medical physicist who is certified in medical physics by a specialty board recognized by the Commission or an Agreement State; or

?ii. In clinical nuclear medicine facilities providing diagnostic and/or therapeutic services under the direction of physicians who meet the requirements for authorized users in Sec. Sec. 35.57, 35.290, or 35.390;

iii. Pass an examination, administered by diplomates of the specialty board, that assesses knowledge and competence in clinical diagnostic radiological or nuclear medicine physics and in radiation safety; or

2. Has completed a structured educational program consisting of both:

a. 200 hours of didactic and laboratory training in the following areas:

i. Radiation physics and instrumentation;

ii. Radiation protection;

iii. Mathematics pertaining to the use and measurement of radioactivity;

iv. Radiation biology; and

v. Radiation dosimetry; and

b. One year of full-time radiation safety experience under the supervision of the individual

identified as the radiation safety officer on an Agency, NRC, or an Agreement State

license or permit issued by a NRC master material licensee that authorizes similar type(s)

of use(s) of radioactive material involving the following:

i. Shipping, receiving, and performing related radiation surveys;

ii. Using and performing checks for proper operation of instruments used to determine the activity of dosages, survey meters, and instruments used to measure radionuclides;

- iii. Securing and controlling ~~radioactive~~ byproduct material;
  - iv. Using administrative controls to avoid mistakes in the administration of ~~radioactive~~ byproduct material;
  - v. Using procedures to prevent or minimize radioactive contamination and using proper decontamination procedures;
  - vi. Using emergency procedures to control ~~radioactive~~ byproduct; and
  - vii. Disposing of ~~radioactive~~ byproduct material; ~~and or~~
- c. Has obtained written certification, signed by a preceptor radiation safety officer, that the individual has satisfactorily completed the requirements in subsection (A)(2)(a) and (A)(2)(b) and has achieved a level of radiation safety knowledge sufficient to function independently as a radiation safety officer for a medical use licensee; or
3. Is an authorized user, authorized medical physicist, or authorized nuclear pharmacist identified on the licensee's license and has experience with the radiation safety aspects of similar types of use of radioactive material for which the individual has radiation safety officer responsibilities

**ARTICLE 10. NOTICES, INSTRUCTIONS, AND REPORTS  
TO ~~IONIZING~~ RADIATION WORKERS; INSPECTIONS**

**R12-1-10 Exhibit A. Form ARRA-6 (~~1993~~2011) Notice to Employees**

ARRA-6 (~~1993~~2011) ARIZONA RADIATION REGULATORY AGENCY

NOTICE TO EMPLOYEES

STANDARDS FOR PROTECTION AGAINST ~~IONIZING~~ RADIATION; NOTICES,  
INSTRUCTIONS, AND REPORTS TO WORKERS; INSPECTIONS

In Article 4 of the Arizona Radiation Regulatory Agency (ARRA) rules for the Control of ~~Ionizing~~ Radiation, the Arizona Radiation Regulatory Agency has established standards for your protection against radiation hazards. In Article 10 of the rules for the Control of ~~Ionizing~~ Radiation, the Arizona Radiation Regulatory Agency has established certain provisions for the options of workers engaged in work under an ARRA license or registration.

#### YOUR EMPLOYER'S RESPONSIBILITY

Your employer is required to -

1. Apply these rules to work involving sources of ~~ionizing~~ radiation.
2. Post or otherwise make available to you a copy of the Arizona Radiation Regulatory Agency rules, licenses, and operating procedures which apply to work you are engaged in, and explain their provisions to you.
3. Post notice of violation involving radiological working conditions, proposed imposition of civil penalties, and orders.

#### YOUR RESPONSIBILITY AS A WORKER

You should familiarize yourself with those provisions of the Arizona Radiation Regulatory Agency rules and the operating procedures which apply to the work you are engaged in. You should observe their provisions for your own protection and protection of your co-workers.

#### WHAT IS COVERED BY THESE RULES

1. Limits on exposure to radiation and radioactive material in restricted and unrestricted areas.
2. Measures to be taken after accidental exposure;
3. Personnel monitoring, surveys, and equipment;

4. Caution signs, labels, and safety interlock equipment;
5. Exposure records and reports;
6. Options for workers regarding ARRA inspections; and
7. Related matters.

## REPORTS ON YOUR RADIATION EXPOSURE HISTORY

1. The Arizona Radiation Regulatory Agency 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 license. The basic limits for exposure to employees are set forth in Article 4 of the rules. These Sections specify limits on exposure to radiation and exposure to concentrations of radioactive material in air and water.
2. If you work where personnel monitoring is required, and if you request information on your radiation exposures,
  - a. Your employer must give you a written report, upon termination of your employment, of your radiation exposures; and
  - b. Your employer must advise you annually of your exposure to radiation.

## INSPECTIONS

All licensed or registered activities are subject to inspection by representatives of the Arizona Radiation Regulatory Agency. In addition, any worker or representative of workers who believes that there is a violation of the regulations issued thereunder, or the terms of the employer's license or rules with regard to radiological working conditions in which the worker is engaged, may request an inspection by sending a notice of the alleged violation to the Arizona Radiation Regulatory Agency. The request must set forth the specific grounds for the notice and must be

signed by the worker on his own behalf or as a representative of the workers. During inspections, ARRA inspectors may confer privately with workers, and any worker may bring to the attention of the inspectors any past or present condition which he believes contributed to or caused any violation as described above.

## INQUIRIES

Inquiries dealing with the matters outlined above can be sent to the:

ARIZONA RADIATION REGULATORY AGENCY

## POSTING REQUIREMENT

IN ACCORDANCE WITH A.A.C. R12-1-1002, COPIES OF THIS NOTICE SHALL BE POSTED IN SUCH A MANNER TO PERMIT EMPLOYEES WORKING IN OR FREQUENTING ANY PORTION OF A RESTRICTED AREA, USED FOR ACTIVITIES LICENSED OR REGISTERED PURSUANT TO ARTICLE 2 OR ARTICLE 3 OF THE AGENCY'S RULES, TO OBSERVE A COPY OR COPIES ON THE WAY TO OR FROM THEIR WORK AREA.

## ARTICLE 15. TRANSPORTATION

### **R12-1-1501. Requirement for License**

- A.** A person shall not transport radioactive material or deliver radioactive material to a carrier for transport unless the person is authorized in a general or specific license issued by the Agency or exempt under R12-1-103(A).
- B.** The rules in this Article apply to any licensee to transfer licensed material, if the licensee delivers that material to a carrier for transport, transports the material outside the site of

usage as specified in the license, or transports that material on public highways. No provision of this Article authorizes possession of licensed material.

**R12-1-1509. General License: Plutonium-Beryllium Special Form Material**

- A.** A general license is issued to any licensee of the Agency to transport fissile material in the form of plutonium-beryllium (Pu-Be) special form sealed sources, or to deliver Pu-Be sealed sources to a carrier for transport, if the material is shipped in accordance with this Article. This material must be contained in a Type A package. The Type A package must also meet the DOT requirements of 49 CFR 173.417(a), revised October 1, 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.
- B.** The general license applies only to a licensee who has a quality assurance program approved by the Agency as satisfying the provisions of R12-1-1507.
- C.** The general license applies only when a package's contents:
1. Contain no more than a Type A quantity of radioactive material; and
  2. Contain less than 1000 g of plutonium, provided that: plutonium-239, plutonium-241, or any combination of these radionuclides, constitutes less than 240 g of the total quantity of plutonium in the package.
- D.** The general license applies only to packages labeled with a CSI which:
1. Has been determined in accordance with paragraph (E) of this section;
  2. Has a value less than or equal to 100; and

3. For a shipment of multiple packages containing Pu-Be sealed sources, the sum of the CSIs must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).

**E.** The value for the CSI must be greater than or equal to the number calculated by the following equation:

1.  $CSI=10[(\text{grams of } ^{239}\text{Pu} + \text{grams of } ^{241}\text{Pu})/24]$ ;

2. The calculated CSI must be rounded up to the first decimal place.

**R12-1-1510. Packaging**

**A.** A general license is issued to any licensee to transport, or to deliver to a carrier for transport, licensed material in a package for which a license, certificate of compliance, or other approval has been issued by the NRC.

1. This general license applies only to a licensee that has a quality assurance program approved by the Agency as satisfying R12-1-1507;

2. This general license applies only to a licensee that:

a. Has a copy of the license, certificate of compliance, or other approval of the package, and has the drawings and other documents referenced in the approval relating to the use and maintenance of the packaging and to the actions to be taken before shipment;

- b. Complies with the terms and conditions of the license, certificate, or other approval, as applicable, and the applicable requirements of this Article;  
and
  - c. Before the licensee's first use of the package, submits in writing to the Agency the licensee's name, license number, and the package identification number specified in the package approval.
3. This general license applies only when the package approval authorizes use of the package under this general license.
4. The general license applies only when a package's contents:
- a. Contain no more than a Type A quantity of radioactive material; and
  - b. Contain less than 500 total grams of beryllium, graphite, or hydrogenous material enriched in deuterium.
5. The general license applies only to packages containing fissile material that are labeled with a CSI which:
- a. Has been determined in accordance with paragraph (e) of this section;
  - b. Has a value less than or equal to 10; and
  - c. For a shipment of multiple packages containing fissile material, the sum of the CSIs must be less than or equal to 50 (for shipment on a nonexclusive use conveyance) and less than or equal to 100 (for shipment on an exclusive use conveyance).
6. The CSI value must meet the following requirements:

- a. The value for the CSI must be greater than or equal to the number calculated by the following equation:  $CSI=10[(\text{grams of } ^{235}\text{U}/X) + (\text{grams of } ^{235}\text{U}/Y) + \text{grams of } ^{235}\text{U}/Z]$ ;
- b. The calculated CSI must be rounded up to the first decimal place;
- c. The values of X, Y, and Z used in the CSI equation must be taken from Tables 71–1 or 71–2 as appropriate located in 10 CFR 71.22 , revised January 1, 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments;
- d. If Table 71–2 is used to obtain the value of X, then the values for the terms in the equation for uranium-233 and plutonium must be assumed to be zero; and
- e. Table 71–1 values for X, Y, and Z must be used to determine the CSI if:
  - i. Uranium-233 is present in the package;
  - ii. The mass of plutonium exceeds 1 percent of the mass of uranium-235;
  - iii. The uranium is of unknown uranium-235 enrichment or greater than 24 weight percent enrichment; or
  - iv. Substances having a moderating effectiveness (i.e., an average hydrogen density greater than H<sub>2</sub>O) (e.g., certain hydrocarbon oils or plastics) are present in any form, except as polyethylene used for packing or wrapping.

47. For a Type B or fissile material package, the design of which was approved by NRC before April 1, 1996, the general license is subject to the additional restrictions of subsection (B).

**B.** Type B packages.

1. A Type B package previously approved by NRC but not designated as B(U) or B(M) in the identification number of the NRC Certificate of Compliance, may be used under the general license of subsection (A) with the following additional conditions:
  - a. Fabrication of the packaging is satisfactorily completed by August 31, 1986, as demonstrated by application of its model number in accordance with 10 CFR 71.85(c) (Revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.);
  - b. A package that is used for a shipment to a location outside the United States is subject to multilateral approval, as defined in 49 CFR 173.403 (Revised October 1, ~~2007~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.); and
  - c. A serial number that uniquely identifies each package which conforms to the approved design and is assigned to, and legibly and durably marked on, the outside of each package.

- d. The licensee shall ascertain that there are no cracks, pinholes, uncontrolled voids, or other defects that could significantly reduce the effectiveness of the packaging;
  - e. Where the maximum normal operating pressure will exceed 35 kPa (5 lbf/in<sup>2</sup>) gauge, the licensee shall test the containment system at an internal pressure at least 50 percent higher than the maximum normal operating pressure, to verify the capability of that system to maintain its structural integrity at that pressure; and
2. A Type B(U) package, a Type B(M) package, a low specific activity (LSA) material package or a fissile material package, previously approved by the NRC but without the “-85” designation in the identification number of the NRC certificate of compliance, may be used under the general license of subsection (A) with the following additional conditions:
- a. Fabrication of the packaging is satisfactorily completed by April 1, 1999 as demonstrated by application of its model number in accordance with 10 CFR 71.85(c) (Revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.);
  - b. A package that is used for a shipment to a location outside the United States is subject to multilateral approval as defined in 49 CFR 173.403 (Revised October 1, ~~2007~~ 2010, incorporated by reference, and available

- under R12-1-101. This incorporated material contains no future editions or amendments.); and
- c. A serial number which uniquely identifies each package which conforms to the approved design and is assigned to, and legibly and durably marked on, the outside of each package.
3. A licensee may modify the design and authorized contents of a Type B package, or a fissile material package, previously approved by NRC, provided:
- a. The modifications of a Type B package are not significant with respect to the design, operating characteristics, or safe performance of the containment system, when the package is subjected to the tests specified in 10 CFR 71.71 and 71.73 (Revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.);
  - b. The modifications of a fissile material package are not significant, with respect to the prevention of criticality, when the package is subjected to the tests specified in 10 CFR 71.71 and 71.73 (Revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.); and
  - c. The modifications to the package satisfy the requirements of this Section.
4. The NRC will revise the package identification number to designate previously approved package designs as B(U), B(M), AF, BF, or A as applicable, and with

the identification number suffix “-85” after receipt of an application demonstrating that the design meets the requirements of this Section.

5. For purposes of this Section, package types are defined in 10 CFR 71.4, revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101.

This incorporated material contains no future editions or amendments.

- C. A general license is issued to any licensee of the Agency to transport fissile material, or to deliver to a carrier for transport, licensed material in a specification container for fissile material or for a Type B quantity of radioactive material as specified in 49 CFR 173 and 178 (Revised October 1, ~~2007~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.) if the following requirements are met:

1. The licensee shall maintain a quality assurance program approved by the Agency as satisfying R12-1-1507.
2. The licensee shall:
  - a. Maintain a copy of the specification; and
  - b. Comply with the terms and conditions of the specification and the applicable requirements in 10 CFR 71, Subparts A, G, and H, revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.
3. The licensee may not use the specification container for a shipment to a location outside the United States, except by multilateral approval, as defined in 49 CFR

173.403, revised October 1, ~~2007~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.

**D.** Foreign packaging.

1. A general license is issued to any licensee of the Agency to transport, or to deliver to a carrier for transport, licensed material in a package the design of which has been approved in a foreign national competent authority certificate that has been revalidated by the Federal Department of Transportation as meeting the applicable requirements of 49 CFR 171.12, revised October 1, ~~2007~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.
2. Except as otherwise provided in this Section, the general license applies only to a licensee who has a quality assurance program approved by the Agency as satisfying the applicable provisions of R12-1-1507.
3. This general license applies only to:
  - a. Shipments made to or from locations outside the United States.
  - b. A licensee that:
    - i. Has a copy of the applicable certificate, the revalidation, and the drawings and other documents referenced in the certificate, relating to the use and maintenance of the packaging and to the actions to be taken before shipment; and

- ii. Complies with the terms and conditions of the certificate and revalidation, and with the applicable requirements in 10 CFR 71, Subparts A, G, and H, revised January 1, ~~2008~~ 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments. With respect to the quality assurance provisions of Subpart H of the regulations, the licensee is exempt from design, construction, and fabrication requirements.

**E.** Assumptions as to unknown properties

When the isotopic abundance, mass, concentration, degree of irradiation, degree of moderation, or other pertinent property of fissile material in any package is not known, the licensee shall package the fissile material as if the unknown properties have credible values that will cause the maximum neutron multiplication.

**F.** Routine determination before each shipment of licensed material shall ensure that the package with its contents satisfies the applicable requirements of this Article and of the license. The licensee shall determine that:

1. The package is proper for the contents to be shipped;
2. The package is in unimpaired physical condition except for superficial defects such as marks or dents;
3. Each closure device of the packaging, including any required gasket, is properly installed and secured and free of defects;

4. Any system for containing liquid is adequately sealed and has adequate space or other specified provision for expansion of the liquid;
5. Any pressure relief device is operable and set in accordance with written procedures;
6. The package has been loaded and closed in accordance with written procedures;
7. For fissile material, any moderator or neutron absorber, if required, is present and in proper condition;
8. Any structural part of the package that could be used to lift or tie down the package during transport is rendered inoperable for that purpose, unless it satisfies the design requirements of 10 CFR 71.45 revised January 1, 2010, incorporated by reference, and available under R12-1-101;
9. The level of non-fixed (removable) radioactive contamination on the external surfaces of each package offered for shipment is as low as reasonably achievable, and within the limits specified in DOT regulations in 49 CFR 173.443 revised October 1, 2010, incorporated by reference, and available under R12-1-101;
10. External radiation levels around the package and around the vehicle, if applicable, will not exceed the limits specified in 10 CFR 71.47 revised January 1, 2010, incorporated by reference, and available under R12-1-101, at any time during transportation; and
11. Accessible package surface temperatures will not exceed the limits specified in 10 CFR 71.43(g) revised January 1, 2010, incorporated by reference, and available under R12-1-101, at any time during transportation.

**R12-1-1513. Opening instructions**

Before delivery of a package to a carrier for transport, the licensee shall ensure that any special instructions needed to safely open the package have been sent to, or otherwise made available to, the consignee for the consignee's use in accordance with 10 CFR 20.1906(e) revised January 1, 2010, incorporated by reference, and available under R12-1-101. This incorporated material contains no future editions or amendments.