

**SUBCHAPTER M: LICENSING OF RADIOACTIVE SUBSTANCES
PROCESSING AND STORAGE FACILITIES**

**§§336.1201, 336.1203, 336.1205, 336.1207, 336.1209, 336.1211, 336.1213, 336.1215, 336.1217,
336.1219, 336.1221, 336.1223, 336.1225, 336.1227, 336.1229, 336.1231, 336.1233, 336.1235
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§336.1201. Purpose and Scope.

(a) This section establishes the requirements for management of commercial radioactive substances processing and storage facilities, the procedures and criteria for the issuance of licenses to receive, possess, transport, store, and process radioactive substances from other persons, and the terms and conditions upon which the agency may issue such licenses.

(b) In addition to the requirements of this subchapter, all licensees, unless otherwise specified, are subject to the requirements of Subchapters A - E and G of this chapter (relating to General Provisions; Radioactive Substance Fees; General Disposal Requirements; Standards for Protection Against Radiation; Notices, Instructions, and Reports to Workers and Inspections; and Decommissioning Standards).

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§336.1203. Definitions.

The following words and terms, when used in this subchapter, have the following meanings, unless the context clearly indicates otherwise.

(1) **Commencement of major construction**--Any major structural erection or major alterations to existing structures, or other substantial action that would change the facility design or site for the purpose of establishing a radioactive substances processing or storage facility. The term does not mean the acquisition of existing structures or minor changes thereto.

(2) **Decommissioning**--The final activities carried out at a radioactive substances processing or storage site after completion of processing operations to remove safely from service and reduce residual radioactivity to a level that permits release of the property for unrestricted use and/or termination of the license. Such activities must include:

(A) disposing of all radioactive substances at a licensed radioactive waste disposal site;

(B) dismantling or decontaminating site structures;

(C) decontaminating site surfaces and remaining equipment; and

(D) conducting final closure surveys, decontamination, and reclamation of the site.

(3) **Disposal**--Isolation or removal of radioactive substances from mankind and his environment. The term does not include emissions and discharges under rules of the agency.

(4) **Engineered barriers**--Man-made devices to contain or limit the potential movement of radioactive material, which might result from spills or other accidents.

(5) **Floodplain**--The lowland and relatively flat areas adjoining inland and coastal waters, including flood prone areas of off-shore islands.

(6) **Local government**--A county, an incorporated city or town, a special district, or other political subdivision of the state.

(7) **Major aquifer**--An aquifer that yields large quantities of water in a comparatively large area of the state. Major aquifers are located in the following formations: Ogallala, Alluvium and Bolson Deposits, Edwards-Trinity (Plateau), Edwards (Balcones Fault Zone - San Antonio Region), Edwards (Balcones Fault Zone - Austin Region), Trinity Group, Carrizo-Wilcox, and Gulf Coast.

(8) **Natural barriers**--The natural characteristics of a site or surface and subsurface composition that serves to impede the movement of radioactive material. Natural barriers may include, for example, the location of a facility remote from an aquifer, or the sorptive capability of the soil surrounding a facility.

(9) **Processing**--The storage, extraction of materials, transfer, volume reduction, compaction, incineration, solidification, or other separation and preparation of radioactive substances from other persons for reuse or disposal, including any treatment or activity that renders the waste less hazardous, safer for transport, or amenable to recovery, storage, or disposal.

(10) **Radioactive substances processing facility**--A facility where radioactive substances received from other persons are processed and/or repackaged according to United States Department of Transportation (DOT) regulations.

(11) **Radioactive substances storage facility**--A facility where radioactive substances received from other persons are stored while awaiting shipment to a licensed radioactive substances processing or disposal facility.

(12) **Reconnaissance level information**--Any information or analysis that can be retrieved or generated without the performance of new comprehensive site-specific investigations. Reconnaissance level information includes, but is not limited to, relevant published scientific literature; drilling records required by state agencies, such as the Railroad Commission of Texas, the Texas Commission on Environmental Quality, and the Texas Natural Resources Information System; and reports of governmental agencies.

(13) **Site**--The real property, including the buffer zone, on which a radioactive substances processing or storage facility may be located.

(14) **Site monitoring**--The procedures for the monitoring of the site and environment to assess quality of site operations and performance and to detect and quantify levels and types of radioactivity and chemicals in the environment. It includes preoperational, operational, and license termination phases.

(15) **Site operations**--The routine day-to-day activities carried out at the site for the receipt, processing, and storage of radioactive substances.

(16) **Site suitability**--The capability of the various characteristics of a processing or storage facility or site to safely contain the radioactive substances expected to be present at the site.

(17) **Sole source aquifer**--The aquifer that is the sole or principal source of drinking water for an area designated under the Safe Drinking Water Act of 1974, 42 United States Code Annotated 300f, *et seq.*

(18) **Waste processing and storage categories**--Radionuclides classified as follows:

(A) any one of seven groups into which radionuclides in normal form are classified, according to their toxicity and their relative potential hazard in transport, as specified in §336.1231 of this title (relating to Radioactive Substances Processing and Storage Categories of Radionuclides); and

(B) any radionuclide not specifically listed in one of the categories in §336.1231 of this title shall be assigned to one of the categories in accordance with §336.1231(b) of this title.

(19) **Wetlands**--Areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include playa lakes, swamps, marshes, bogs, and similar areas.

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§336.1205. Activities Requiring License.

Except for persons exempted by this subchapter, no person may receive, possess, store or process radioactive substances from another person except as authorized in a specific license issued in accordance with this subchapter.

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§336.1207. Radioactive Substances Processing and Storage Facility Classification.

(a) Radioactive substances processing and storage facilities are classified according to the radionuclides, other than sealed sources, received, possessed, or processed in each of the waste processing and storage categories, as defined in §336.1203 of this title (relating to Definitions) with all applicable provisions, except that, for the purposes of this section which apply to processing and storage of radioactive substances, Category IV must include waste processing and storage categories IV-VII. The total possession limit of each category of unsealed (dispersible) radionuclides for each class of facility is as follows:

	Category I	Category II	Category III	Category IV
Class I Storage or Processing Facility	10 mCi	100 mCi	1 Ci	10 Ci
Class II Storage Facility	2 Ci	20 Ci	200 Ci	2000 Ci
Class II Processing Facility	1 Ci	10 Ci	100 Ci	1000 Ci

(b) Class III storage facilities are those in which the applicable possession limit of radioactive substances exceeds any limit of Class II storage facilities.

(c) Class III processing facilities are those in which the applicable possession limit of radioactive substances exceeds any limit of Class II processing facilities.

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§336.1209. Exemptions.

(a) Sealed sources. Persons who receive, possess, or process sealed sources of radioactive material as radioactive waste from other persons are exempt from this section, provided that:

(1) encapsulated sources are tested upon receipt and determined to have less than 0.005 microcurie of removable contamination; and

(2) sealed sources of radioactive material remain in sealed form after receipt.

(b) Unsealed sources.

(1) Persons who receive, possess, or process sources of radioactive material in unsealed form as radioactive waste from other persons are exempt from this section provided that:

(A) the total radioactivity of all radioactive waste possessed at any one time does not exceed the applicable limits for Class I processing or storage facilities as described in §336.1207 of this title (relating to Radioactive Substances Processing and Storage Facility Classification); and

(B) the total volume of radioactive waste processed in any one year does not exceed 50 cubic feet.

(2) Persons who receive, possess, and store radioactive material in unsealed form as radioactive substances from other persons are exempt from this section provided that:

(A) the radioactive substance consists only of radiopharmaceutical residues resulting from radiopharmaceuticals manufactured, compounded, and supplied by those persons receiving the radiopharmaceutical residues as radioactive waste;

(B) the radioactive substance is held in storage for decay to background radiation levels; and

(C) the radioactive substances is not shipped to a radioactive waste processing or disposal facility.

(c) Radioactive material. A person who receives, possesses, and stores radioactive material as waste from sites owned and controlled by that same person is not considered to have received waste from other persons.

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§336.1211. Filing Application for a Specific License.

Unless otherwise specified, an applicant for a license to receive, possess, or process radioactive substances from other persons is subject to the requirements in §336.205 of this title (relating to Application Requirements). The applicant shall also comply with the following additional filing requirements.

(1) The applicant for a license to receive, possess, or process radioactive substances from other persons shall submit seven copies of each license application or application for amendment and any supporting documents in a manner specified by the agency. Applications for issuance of licenses must include all general and specific technical requirements, financial information, and environmental requirements, if applicable, described in this section.

(2) Each application must clearly demonstrate how the requirements of this section and §§336.1213, 336.1215, and 336.1217 of this title (relating to Additional Environmental Requirements for Class III Facilities, Issuance of Licenses, Commencement of Major Construction, respectively) have been addressed.

(3) Applications for licenses will be processed in accordance with the requirements of Chapter 281 of this title (relating to Applications Processing).

(4) An applicant for a license under this section must include the following additional information in the application:

(A) identity of the applicant including the full name, address, telephone number, and description of the business(es) or occupation(s) of the applicant;

(B) the organizational structure of the applicant, both off-site and on-site, including a description of lines of authority and assignments of responsibilities, whether in the form of administrative directives, contract provisions, or otherwise;

(C) a description of past operations that the applicant has been involved in including any license limitations, suspensions or revocations of such licenses, and any other information that will allow the agency to assess the applicant's past operating history;

(D) the technical qualifications, including training and experience, of the applicant and members of the applicant's staff to engage in the proposed activities; and minimum training and experience requirements for personnel;

(E) a description of the personnel training and retraining program;

(F) a statement of need and a description of the proposed activities identifying:

(i) the location of the proposed site;

(ii) the character of the proposed activities;

(iii) the types, chemical and/or physical forms and quantities of radioactive substances to be received, possessed, and processed; and

(iv) the plans for use of the facility for purposes other than processing of radioactive substances;

(G) proposed time schedules for construction and receipt and processing of radioactive waste at the proposed facility;

(H) description of the site and accurate drawings of the facility including, but not limited to:

(i) construction;

(ii) foundation details;

(iii) ventilation;

(iv) plumbing and fire suppression systems;

(v) physical security system;

(vi) storage areas;

(vii) radioactive substances handling or processing areas;

(viii) proximity to creeks or culverts; and

(ix) soil types under the facility with respect to compatibility with foundation and structural design;

(I) a description that demonstrates that the site suitability characteristics will meet the following requirements:

(i) the overall hydrogeologic environment of the site, in combination with engineering design, must act to minimize and control potential migration of radioactive substances into surface water and groundwaters;

(ii) no new site may be located in a 100-year floodplain, as designated by the Commission, or a wetland; and

(iii) no new site may be located in the recharge area of a sole source aquifer or a major aquifer unless it can be demonstrated with reasonable assurance that the new site will be designed, constructed, operated, and closed without an unreasonable risk to the aquifer.

(J) minimum criteria for facility design and operation to include:

(i) the building used for processing radioactive wastes must have a minimum classification of Type II (111) in accordance with National Fire Protection Association 220 titled, "Standard Types of Building Construction;"

(I) buildings used for processing or storage of radioactive substances shall have ventilation and fire protection systems to minimize the release of radioactive materials into the soils, waters, and the atmosphere; and

(II) facilities and equipment for repackaging leaking and/or damaged containers must be provided.

(ii) the design and operation of the radioactive substances processing or storage facility must be such that:

(I) releases of non-radiological noxious materials from the facility are minimized; and

(II) radiation levels, concentrations, and potential exposures off-site due to airborne releases during operations are within the limits established in Subchapter D of this chapter and are maintained as low as reasonably achievable.

(iii) the design and operation of the radioactive substances processing or storage facility must be compatible with the objectives of the site closure and decommissioning plan;

(iv) the facility must be designed to confine spills. Independent and diverse engineered barriers must be provided, as necessary, to complement natural barriers in minimizing potential releases from the facility and in complying with this section;

(v) the location and construction of any new radioactive substances processing facility must have a buffer zone adequate to permit emergency measures to be implemented following accidents and to address airborne plume dispersions and, as a minimum, shall be such that:

(I) the active components of a Class II facility are located at least 30 meters from the nearest residence as of the date of the license application; and

(II) the active components of a Class III facility are located at least 30 meters from the nearest property not owned or occupied by the licensee.

(K) a flow diagram of radioactive substances processing operations;

(L) a description and accurate drawings of processing equipment and any required special handling techniques to be employed;

(M) a description of personnel monitoring methods, training, and procedures to be followed to keep employees from ingesting and inhaling radioactive materials, including a description of methods to keep the radiation exposure to levels as low as reasonably achievable;

(N) a description of the site monitoring program to include prelicense data and proposed operational monitoring programs for direct gamma radiation measurements and radioactive and chemical characteristics of the soils, groundwater, surface waters, and vegetation, as applicable;

(i) for radioactive substances storage facilities, the applicant shall address on-site air quality; and

(ii) for radioactive substances processing facilities, the applicant shall address on-site and off-site air quality;

(O) spill detection and cleanup plans for the licensed site and for associated transportation of radioactive material;

(P) an operating, safety, and emergency procedures manual that must provide detailed procedures for receiving, handling, storing, processing, and shipping radioactive substances;

(Q) for radioactive substances processing facilities, a description of the equipment to be installed to maintain control over maximum concentrations of radioactive materials in gaseous and liquid effluents produced during normal operations and the means to be employed for keeping levels of radioactive material in effluents to unrestricted areas as low as reasonably achievable and within the limits listed in Subchapter D of this chapter;

(R) methods of ultimate disposal and decommissioning; and

(S) the system for maintaining inventory of receipt, storage, and transfer of radioactive substances.

(T) an adequate operating, radiation safety, and emergency procedures manual;
and

(U) a signed certification from the owner or owners of the real property on which radioactive substances are stored or processed acknowledging that:

(i) radioactive substances are stored or processed on the property with the consent of the property owner or owners; and

(ii) decommissioning of the site may be required even if the applicant or licensee is unable or fails to decommission the site as required by a license, rule or order of the commission.

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§336.1213. Additional Environmental Requirements .

An application for a license for a processing or storage facility must include environmental information that may be based on reconnaissance level information when appropriate and addresses the following:

(1) description of present land uses and population distribution in the vicinity of the site:

(A) for radioactive substances storage facilities, the description must address properties adjacent to the site; and

(B) for radioactive substances processing facilities, the description must address properties adjacent to the site and shall include population distribution within a one-mile radius of the site;

(2) area/site suitability including geology, hydrology, and natural hazards. For radioactive substances processing facilities, area meteorology also must be addressed;

(3) site and project alternatives including alternative siting analysis;

(4) socioeconomic effects on surrounding communities of operation of the licensed activity and of associated transportation of radioactive material; and

(5) environmental effects of postulated accidents.

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§336.1215. Issuance of Licenses.

(a) A license for a radioactive substances processing or storage facility may be issued if the agency finds reasonable assurance that:

(1) an application meets the requirements of the Texas Radiation Control Act and the rules of the agency;

(2) the proposed radioactive substances facility will be sited, designed, operated, decommissioned, and closed in accordance with this chapter;

(3) the issuance of the license will not be inimical to the health and safety of the public or the environment; and

(4) there is no reason to deny the license because of:

(A) any material false statement in the application or any statement of fact required under provisions of the Texas Radiation Control Act;

(B) conditions revealed by the application or statement of fact or any report, record, or inspection, or other means that would warrant the agency to refuse to grant a license on an application; or

(C) failure to clearly demonstrate how the requirements in this chapter have been addressed; and

(5) qualifications of the designated radiation safety officer (RSO) are adequate for the purpose requested in the application and include as a minimum:

(A) have earned at least a bachelor's degree in a physical or biological science, industrial hygiene, health physics, radiation protection, or engineering from an accredited college or university, or an equivalent combination of training and relevant experience, with two years of relevant experience equivalent to a year of academic study, from a uranium or mineral extraction/recovery, radioactive waste processing, or a radioactive waste or by-product material disposal facility;

(B) have at least one year of relevant experience, in addition to that used to meet the educational requirement, working under the direct supervision of the radiation safety officer at a uranium or mineral extraction/recovery, radioactive waste processing, or radioactive waste or by-product material disposal facility; and

(C) have at least four weeks of specialized training in health physics or radiation safety applicable to uranium or mineral extraction/recovery, radioactive waste processing, or radioactive waste or by-product material disposal operations from a course provider that has been evaluated and approved by the agency.

(b) The agency may request, and the licensee must provide, additional information after the license has been issued to enable the agency to determine whether the license should be modified, suspended, or revoked.

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§336.1217. Commencement of Major Construction.

Commencement of major construction is prohibited until a license has been issued by the commission.

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§336.1219. Commencement of Operations.

No licensee issued a license under this section may commence operations until the licensee has obtained licenses or permits from other agencies as required by law.

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§336.1221. Specific Terms and Conditions of Licenses.

(a) Unless otherwise specified, each license issued in accordance with this subchapter is subject to the requirements in §305.125 of this title (relating to Standard Permit Conditions). A license issued under this subchapter must include license conditions derived from the evaluations of the application and analyses performed by the agency, including amendments and changes made before a license is issued. License conditions may include, but are not limited to, the following:

- (1) restrictions as to the total radioactive inventory of radioactive substances to be received;
- (2) restrictions as to size, shape, and materials and methods of construction of radioactive substances packaging and maximum number of package units stored, at any one time;
- (3) restrictions as to the physical and chemical form and radioisotopic content and concentration of radioactive substances;
- (4) controls to be applied to restrict access to the site;
- (5) controls to be applied to maintain and protect the health and safety of the public and site employees and the environment;
- (6) administrative controls, which are the provisions relating to organization, management, and operating procedures; record-keeping, review and audit; and reporting necessary to assure that activities at the facility are conducted in a safe manner and in conformity with agency rules and license conditions;
- (7) maximum retention time for radioactive substances received at the facility; and
- (8) term of the specific license for a fixed term not to exceed ten years.

(b) The commission may incorporate in any license at the time of issuance, or thereafter, by appropriate rule or order, additional requirements or conditions with respect to the licensee's receipt, possession, or transfer of radioactive substances as it deems appropriate or necessary in order to:

- (1) protect the health and safety of the public and the environment; or
- (2) require reports and recordkeeping and to provide for inspections of activities under the licenses that may be necessary or appropriate to effectuate the purposes of the Texas Radiation Control Act and rules thereunder.

(c) Each person licensed by the commission in accordance with this subchapter shall confine the use and possession of the radioactive substance licensed to the locations and purposes authorized in the license.

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§336.1223. Renewal of Licenses.

(a) Renewal of licenses must be filed in accordance with §336.205 of this title (relating to Application Requirements) and §336.1211 of this title (relating to Filing Application for a Specific License).

(b) The licensee is responsible for decommissioning the facility and continued safe storage of any radioactive substances whether an application for continued receipt of radioactive substances is filed or not.

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§336.1225. Amendment of License at Request of Licensee.

Applications for amendment of a license shall be filed in accordance with §336.1211 of this title (relating to Filing Application for a Specific License) and §336.205 of this title (relating to Application Requirements). Amendment applications must be signed by the RSO, specify the proposed amendment, and describe the basis for such amendment.

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§336.1227. Radioactive Substances Processing and Packaging Requirements.

All processed radioactive substances offered for transport or disposal must meet:

(1) all applicable transportation requirements of the agency, the United States Nuclear Regulatory Commission, and of the DOT; and

(2) all applicable disposal facility license conditions.

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§336.1229. Environmental Assessment.

A written analysis of the impact on the human environment will be prepared or secured by the agency for any license for a class III processing or storage facility in accordance with §281.21(f) of this title (relating to Draft Permit, Technical Summary, Fact Sheet, and Compliance History).

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§336.1231. Radioactive Substances Processing and Storage Categories of Radionuclides.

(a) The following table contains waste processing and storage categories of radionuclides.

Element*	Radionuclide**	Category
Actinium (89)	Ac-227	I
	Ac-228	I
Americium (95)	Am-241	I
	Am-243	I
Antimony (51)	Sb-122	IV
	Sb-124	III
	Sb-125	III
Argon (18)	Ar-37	VI
	Ar-41	II
	Ar-41 (uncompressed)†	V
Arsenic (33)	As-73	IV
	As-74	IV
	As-76	IV
	As-77	IV
Astatine (85)	At-211	III
Barium (56)	Ba-131	IV
	Ba-133	II
	Ba-140	III
Berkelium (97)	Bk-249	I
Beryllium (4)	Be-7	IV
Bismuth (83)	Bi-206	IV
	Bi-207	III
	Bi-210	II
	Bi-212	III
Bromine (35)	Br-82	IV
Cadmium (48)	Cd-109	IV
	Cd-115m	III
	Cd-115	IV
Calcium (20)	Ca-45	IV
	Ca-47	IV
Californium (98)	Cf-249	I
	Cf-250	I
	Cf-252	I
Carbon (6)	C-14	IV
Cerium (58)	Ce-141	IV
	Ce-143	IV

Element*	Radionuclide**	Category
	Ce-144	III
Cesium (55)	Cs-131	IV
	Cs-134mCs-134	IIIII
	Cs-135	IV
	Cs-136	IV
	Cs-137	III
Chlorine (17)	Cl-36	III
	Cl-38	IV
Chromium (24)	Cr-51	IV
Cobalt (27)	Co-56	III
	Co-57	IV
	Co-58m	IV
	Co-58	IV
	Co-60	III
Copper (29)	Cu-64	IV
Curium (96)	Cm-242	I
	Cm-243	I
	Cm-244	I
	Cm-245	I
	Cm-246	I
Dysprosium (66)	Dy-154	III
	Dy-165	IV
	Dy-166	IV
Erbium (68)	Er-169	IV
	Er-171	IV
Europium (63)	Eu-150Eu-152m	IIIV
	Eu-152	III
	Eu-154	II
	Eu-155	IV
Fluorine (9)	F-18	IV
Gadolinium (64)	Gd-153	IV
	Gd-159	IV
Gallium (31)	Ga-67	III
	Ga-72	IV
Germanium (32)	Ge-71	IV
Gold (79)	Au-193	III
	Au-194	III
	Au-195	III
	Au-196	IV
	Au-198	IV

Element*	Radionuclide**	Category
	Au-199	IV
Hafnium (72)	Hf-181	IV
Holmium (67)	Ho-166	IV
Hydrogen (1)	H-3 (see tritium)	
Indium (49)	In-113m	IV
	In-114m	III
	In-115m	IV
	In-115	IV
Iodine (53)	I-124	III
	I-125I-126	IIIII
	I-129	III
	I-131	III
	I-132	IV
	I-133	III
	I-134	IV
	I-135	IV
Iridium (77)	Ir-190	IV
	Ir-192	III
	Ir-194	IV
Iron (26)	Fe-55	IV
	Fe-59	IV
Krypton (36)	Kr-85m	III
	Kr-85m (uncompressed)†	V
	Kr-85	III
	Kr-85 (uncompressed)†	VI
	Kr-87	II
	Kr-87 (uncompressed)†	V
Lanthanum (57)	La-140	IV
Lead (82)	Pb-203	IV
	Pb-210	II
	Pb-212	II
Lutetium (71)	Lu-172Lu-177	IIIV
Magnesium (12)	Mg-28	III
Manganese (25)	Mn-52	IV
	Mn-54	IV
	Mn-56	IV
Mercury (80)	Hg-197m	IV
	Hg-197	IV
	Hg-203	IV

Element*	Radionuclide**	Category
Mixed fission products (MFP)		II
Molybdenum (42)	Mo-99	IV
Neodymium (60)	Nd-147	IV
	Nd-149	IV
Neptunium (93)	Np-237	I
	Np-239	I
Nickel (28)	Ni-56	III
	Ni-59	IV
	Ni-63	IV
	Ni-65	IV
Niobium (41)	Nb-93m	IV
	Nb-95	IV
	Nb-97	IV
Osmium (76)	Os-185	IV
	Os-191m	IV
	Os-191Os-193	IVIV
Palladium (46)	Pd-103	IV
	Pd-109	IV
Phosphorus (15)	P-32	IV
Platinum (73)	Pt-191	IV
	Pt-193	IV
	Pt-193m	IV
	Pt-197m	IV
	Pt-197	IV
Plutonium (94)	Pu-238 F	I
	Pu-239 F	I
	Pu-240	I
	Pu-241 F	I
	Pu-242	I
Polonium (84)	Po-210	I
Potassium (19)	K-42	IV
	K-43	III
Praseodymium (59)	Pr-142	IV
	Pr-143	IV
Promethium (61)	Pm-147	IV
	Pm-149	IV
Protactinium (91)	Pa-230	I
	Pa-231	I

Element*	Radionuclide**	Category
	Pa-233	II
Radium (88)	Ra-223	II
	Ra-224	II
	Ra-226	I
	Ra-228	I
Radon (86)	Rn-220	IV
	Rn-222	II
Rhenium (75)	Re-183	IV
	Re-186	IV
	Re-187	IV
	Re-188	IV
	Re-Natural	IV
Rhodium (45)	Rh-103m	IV
	Rh-105	IV
Rubidium (37)	Rb-86	IV
	Rb-87	IV
	Rb-Natural	IV
Ruthenium (44)	Ru-97	IV
	Ru-103	IV
	Ru-105	IV
	Ru-106	III
Samarium (62)	Sm-145	III
	Sm-147	III
	Sm-151Sm-153	IVIV
Scandium (21)	Sc-46	III
	Sc-47	IV
	Sc-48	IV
Selenium (34)	Se-75	IV
Silicon (14)	Si-31	IV
Silver (47)	Ag-105	IV
	Ag-110m	III
	Ag-111	IV
Sodium (11)	Na-22	III
	Na-24	IV
Strontium (38)	Sr-85m	IV
	Sr-85	IV
	Sr-89	III
	Sr-90	II
	Sr-91	III
	Sr-92	IV

Element*	Radionuclide**	Category
Sulfur (16)	S-35	IV
Tantalum (73)	Ta-182	III
Technetium (43)	Tc-96m	IV
	Tc-96	IV
	Tc-97m	IV
	Tc-97	IV
	Tc-99mTc-99	IVIV
Tellurium (52)	Te-125m	IV
	Te-127m	IV
	Te-127	IV
	Te-129m	III
	Te-129	IV
	Te-131m	III
	Te-132	IV
Terbium (65)	Tb-160	III
Thallium (81)	Tl-200	IV
	Tl-201	IV
	Tl-202	IV
	Tl-204	III
Thorium (90)	Th-227	II
	Th-228	I
	Th-230	I
	Th-231	I
	Th-232	III
	Th-234	II
	Th-Natural	III
Thulium (69)	Tm-168	III
	Tm-170	III
	Tm-171	IV
Tin (50)	Sn-113	IV
	Sn-117m	III
	Sn-121	III
	Sn-125	IV
Tritium (1)	H-3	IV
	H-3 (as a gas, as luminous paint, or adsorbed on solid material.)	VII
Tungsten (74)	W-181	IV
	W-185	IV
	W-187	IV
Uranium (92)	U-230	II

Element*	Radionuclide**	Category
	U-232	I
	U-233 F	II
	U-234	II
	U-235 F	III
	U-236	II
	U-238	III
	U-Natural	III
	U-Enriched F	III
	U-Depleted	III
Vanadium (23)	V-48	IV
	V-49	III
Xenon (54)	Xe-125	III
	Xe-131m	III
	Xe-131m (uncompressed)†	V
	Xe-133	III
	Xe-133 (uncompressed)†	VI
	Xe-135	II
	Xe-135 (uncompressed)†	V
Ytterbium (70)	Yb-175	IV
Yttrium (39)	Y-88	III
	Y-90	IV
	Y-91m	III
	Y-91	III
	Y-92	IV
	Y-93	IV
Zinc (30)	Zn-65	IV
	Zn-69m	IV
	Zn-69	IV
Zirconium (40)	Zr-93	IV
	Zr-95	III
	Zr-97	IV

NOTE: For mixtures of radionuclides and for radionuclides not included in this subsection, see subsection (b) of this section, waste processing and storage categories.

* Atomic number shown in parentheses.

** Atomic mass number shown after the element symbol.

F Fissile material.

m Metastable state.

† Uncompressed means at a pressure not exceeding 1 atmosphere.

(b) Any radionuclide not specifically listed in subsection (a) of this section must be assigned to one of the categories in accordance with the following table.

Radionuclide Atomic No.	RADIOACTIVE HALF-LIFE		
	0 to 1000 days	1000 days to 10 ⁶ years	Over 10 ⁶ years
1-81	Category III	Category II	Category III
82 and over	Category I	Category I	Category III

(c) For mixtures of radionuclides, the following must apply.

(1) If the identity and respective activity of each radionuclide are known, the permissible activity of each radionuclide shall be such that the sum, for all categories present, of the ratio between the total activity for each category to the permissible activity for each category will not be greater than unity.

(2) If the categories of the radionuclides are known but the amount in each category cannot be reasonably determined, the mixture must be assigned to the most restrictive category present.

(3) If the identity of all or some of the radionuclides cannot be reasonably determined, each of those unidentified radionuclides shall be considered as belonging to the most restrictive category that cannot be positively excluded.

(4) Mixtures consisting of a single radioactive decay chain where the radionuclides are in the naturally occurring proportions must be considered as consisting of a single radionuclide. The category and activity must be that of the first member present in the chain, except that if radionuclide "X" has a half-life longer than that of that first member and an activity greater than that of any other member, including the first, at any time during processing, the waste processing and storage category must be that of nuclide "X" and the activity of the mixture must be the maximum activity of nuclide "X" during processing.

Adopted January 30, 2008

Effective February 28, 2008

§336.1233. Radiation Safety Committee.

The duties and responsibilities of the Radiation Safety Committee include but are not limited to the following:

- (1) meeting as often as necessary to conduct business but no less than three times a year;
- (2) reviewing summaries of the following information presented by the radiation safety officer:
 - (A) over-exposures;
 - (B) significant incidents, including spills, contamination, or medical events; and

(C) items of noncompliance following an inspection;

(3) reviewing the program for maintaining doses as low as reasonably achievable, and providing any necessary recommendations to ensure doses are as low as reasonably achievable;

(4) reviewing the overall compliance status for authorized users;

(5) sharing responsibility with the radiation safety officer to conduct periodic audits of the radiation safety program;

(6) reviewing the audit of the radiation safety program and acting upon the findings;

(7) developing criteria to evaluate training and experience of new authorized user applicants;

(8) evaluating and approving authorized user applicants who request authorization to use radioactive material at the facility;

(9) evaluating new uses of radioactive material; and

(10) reviewing and approving permitted program and procedural changes prior to implementation.

Adopted January 30, 2008

Effective February 28, 2008

§336.1235. Financial Assurance for Storage and Processing.

(a) A licensee must establish financial assurance for decommissioning and any other requirements of this subchapter 60 days prior to the initial possession of radioactive substances.

(b) In establishing financial assurance, the licensee's cost estimates must take into account total costs that would be incurred if an independent contractor were hired to perform the decommissioning. The amount of financial assurance must be in an amount approved by the agency.

(c) The licensee's financial assurance mechanism and the underlying cost estimates will be reviewed annually by the agency to assure that sufficient funds are available for completion of decommissioning. The amount of financial assurance must be adjusted to recognize any increases resulting from inflation, changes in engineering plans, activities performed, and any other conditions affecting costs. A licensee must submit a cost estimate report annually for decommissioning the facility in accordance with the decommissioning plan by no later than an anniversary date as determined by the executive director. The licensee must provide any increase in the amount of financial assurance within 60 days of a determination of the cost estimate by the executive director.

(d) Financial assurance required under this subchapter must meet the requirements specified in Chapter 37, Subchapter T of this title (relating to Financial Assurance for Radioactive Substances and Aquifer Restoration) by June 1, 2009. Regardless of whether reclamation is phased through the life of the operation or takes place at the end of operations, an appropriate portion of financial assurance amount as

determined by the executive director shall be retained until final compliance with the reclamation plan is determined. This will yield a financial assurance mechanism that is at least sufficient at all times to cover the costs of decommissioning and reclamation of the areas that are expected to be disturbed before the next license renewal.

Adopted February 11, 2009

Effective March 12, 2009