

*The Agency is seeking your input regarding the following noted suggested rule changes. These suggested changes are NOT final rule changes.*

Legend: (Draft 2 Rule Changes)

Single Underline = Draft new language since Draft 1

**[Bold, Print, and Brackets]** = Current language drafted for deletion

Regular Print = Current language, including Draft 1 changes

(No change.) = No changes are being considered for the designated subdivision

§289.257. Packaging and Transportation of Radioactive Material.

(a) - (c) (No change.)

(d) Definitions. The following words and terms when used in this section shall have the following meaning, unless the context clearly indicates otherwise. To ensure compatibility with international transportation standards, all limits in this section are given in terms of dual units: The International System of Units (SI) followed or preceded by United States (U.S.) standard or customary units. The U.S. customary units are not exact equivalents, but are rounded to a convenient value, providing a functionally equivalent unit. For the purpose of this section, SI units shall be used.

(1) - (6) (No change.)

(7) Chemical description--A description of the principal chemical characteristics of low-level radioactive waste (LLRW).

(8) - (18) (No change.)

(19) Freight forwarder--A person or entity which holds itself out to the general public to provide transportation of property for compensation and in the ordinary course of its business:

(A) assembles and consolidates, or provides for assembling and consolidating, shipments and performs break-bulk and distribution operations of the shipments;

(B) assumes responsibility for the transportation from the place of receipt to the place of destination; and

(C) uses for any part of the transportation a rail, motor or water carrier subject to the jurisdiction of either Federal Motor Carrier Safety Administration or the Surface Transportation Board.

(20) Generator--A licensee operating in accordance with an NRC, agreement state, or agency license who:

(A) is a waste generator as defined in this section; or

(B) is the licensee to whom waste can be attributed within the context of the Low-Level Radioactive Waste Policy Amendments Act of 1985 (e.g., waste generated as a result of decontamination or recycle activities).

(21) Graphite--For the purposes of this section, this means graphite with a boron equivalent content of less than 5 parts per million and density greater than 1.5 grams per cubic centimeter.

(22) High integrity container (HIC)--A container commonly designed to meet the structural stability requirements of Title 10, CFR, §61.56, and to meet DOT requirements for a Type A package.

(23) Indian tribe--An Indian or Alaska Native tribe, band, nation, pueblo, village, or community that the Secretary of the Interior acknowledges to exist as an Indian tribe in accordance with the Federally Recognized Indian Tribe List Act of 1994, 25 U.S.C. 479a.

(24) Industrial package (IP)--A packaging that, together with its low specific activity (LSA) material or surface contaminated object (SCO) contents, meets the requirements of Title 49, CFR, §173.410 and §173.411. Industrial packages are categorized in Title 49, CFR, §173.411 as either:

(A) Industrial package Type 1 (IP-1);

(B) Industrial package Type 2 (IP-2); or

(C) Industrial package Type 3 (IP-3).

(25) Low-level radioactive waste (LLRW)--Radioactive material that meets the following criteria:

(A) LLRW is radioactive material that is:

(i) discarded or unwanted and is not exempt by rule adopted in accordance with the Texas Radiation Control Act (Act), Health and Safety Code, §401.106;

(ii) waste, as that term is defined in Title 10, CFR, §61.2; and

(iii) subject to:

(I) concentration limits established in Title 10, CFR, §61.55, or compatible rules adopted by the agency or the Texas Commission on Environmental Quality (TCEQ), as applicable; and

(II) disposal criteria established in Title 10, CFR, or established by the agency or TCEQ, as applicable.

(B) LLRW does not include:

- (i) high-level radioactive waste as defined in Title 10, CFR, §60.2;
- (ii) spent nuclear fuel as defined in Title 10, CFR, §72.3;
- (iii) byproduct material defined in the Act, Health and Safety Code, §401.003(3)(B);
- (iv) naturally occurring radioactive material (NORM) waste that is not oil and gas NORM waste;
- (v) oil and gas NORM waste; or
- (vi) transuranics greater than 100 nanocuries (3.7 kilobecquerels) per gram (g).

(26) Low specific activity (LSA) material--Radioactive material with limited specific activity which is nonfissile or is excepted in accordance with subsection (h) of this section, and which satisfies the following descriptions and limits set forth. Shielding materials surrounding the LSA material may not be considered in determining the estimated average specific activity of the package contents. LSA material shall be in one of the following three groups:

(A) LSA-I.

- (i) Ores containing only naturally occurring radionuclides (e.g., uranium, thorium) and uranium or thorium concentrates of such ores which are not intended to be processed for the use of these radionuclides; or
- (ii) Solid unirradiated natural uranium or depleted uranium or natural thorium or their solid or liquid compounds or mixtures; or
- (iii) Radioactive material for which the  $A_2$  value is unlimited; or
- (iv) Other radioactive material (e.g.: mill tailings, contaminated earth, concrete, rubble, other debris, and activated material) in which the radioactivity is distributed throughout, and the estimated average specific activity does not exceed 30 times the value for exempt material activity concentration determined in accordance with subsection (ee) of this section.

(B) LSA-II.

(i) Water with tritium concentration up to 0.8 terabecquerel per liter (TBq/l) (20.0 curies per liter (Ci/l)); or

(ii) Other material in which the radioactivity is distributed throughout, and the average specific activity does not exceed  $10^{-4}$  A<sub>2</sub>/g for solids and gases, and  $10^{-5}$  A<sub>2</sub>/g for liquids.

(C) LSA-III. Solids (e.g., consolidated wastes, activated materials), excluding powders, that satisfy the requirements of Title 10, CFR, §71.77 in which:

(i) the radioactive material is distributed throughout a solid or a collection of solid objects, or is essentially uniformly distributed in a solid compact binding agent (such as concrete, bitumen, ceramic, etc.); and

(ii) the radioactive material is relatively insoluble, or it is intrinsically contained in a relatively insoluble material, so that, even with a loss of packaging, the loss of radioactive material per package by leaching, when placed in water for 7 days, would not exceed 0.1 A<sub>2</sub>; and

(iii) the average specific activity of the solid does not exceed  $2 \times 10^{-3}$  A<sub>2</sub>/g.

(27) Low toxicity alpha emitters--Natural uranium, depleted uranium, natural thorium; uranium-235, uranium-238, thorium-232, thorium-228 or thorium-230 when contained in ores or physical or chemical concentrates or tailings; or alpha emitters with a half-life of less than 10 days.

(28) Maximum normal operating pressure--The maximum gauge pressure that would develop in the containment system in a period of 1 year under the heat condition specified in Title 10, CFR, §71.71(c)(1), in the absence of venting, external cooling by an ancillary system, or operational controls during transport.

(29) Natural thorium--Thorium with the naturally occurring distribution of thorium isotopes (essentially 100 weight percent thorium-232).

(30) Normal form radioactive material--Radioactive material that has not been demonstrated to qualify as special form radioactive material.

(31) NRC Forms 540, 540A, 541, 541A, 542, and 542A--Official NRC forms referenced in subsection (ff) of this section which includes the information required by DOT in Title 49, CFR, Part 172. Licensees need not use originals of these forms as long as any substitute forms contain the equivalent information. Licensees may include additional information deemed relevant to the licensee's shipment of low-level radioactive waste. Upon agreement between the shipper and consignee, NRC Forms 541 (and 541A) and NRC Forms 542

(and 542A) or equivalent documents may be completed, transmitted, and stored in electronic media. The electronic media shall have the capability for producing legible, accurate, and complete records in the format of the uniform manifest.

(32) Package--The packaging together with its radioactive contents as presented for transport.

(A) Fissile material package, Type AF package, Type BF package, Type B(U)F package, or Type B(M)F package--A fissile material packaging together with its fissile material contents.

(B) Type A package--A Type A packaging together with its radioactive contents. A Type A package is defined and shall comply with the DOT regulations in Title 49, CFR, Part 173.

(C) Type B package--A Type B packaging together with its radioactive contents. On approval by the NRC, a Type B package design is designated by NRC as B(U) unless the package has a maximum normal operating pressure of more than 700 kilopascals (kPa) (100 pounds per square inch (lb/in<sup>2</sup>)) gauge or a pressure relief device that would allow the release of radioactive material to the environment under the tests specified in Title 10, CFR, §71.73 (hypothetical accident conditions), in which case it will receive a designation B(M). B(U) refers to the need for unilateral approval of international shipments; B(M) refers to the need for multilateral approval of international shipments. There is no distinction made in how packages with these designations may be used in domestic transportation. To determine their distinction for international transportation, see DOT regulations in Title 49, CFR, Part 173. A Type B package approved before September 6, 1983, was designated only as Type B. Limitations on its use are specified in Title 10, CFR, §71.19.

(33) Packaging--The assembly of components necessary to ensure compliance with the packaging requirements of this section. It may consist of one or more receptacles, absorbent materials, spacing structures, thermal insulation, radiation shielding, and devices for cooling or absorbing mechanical shocks. The vehicle, tie-down system, and auxiliary equipment may be designated as part of the packaging.

(34) Physical description--The items called for on NRC Form 541 to describe a LLRW.

(35) Registered freight forwarder--A freight forwarder that has an emergency plan approved in accordance with subsection(r) of this section and been issued a registration letter.

(36) Registered shipper--A shipper that has an emergency plan approved in accordance with subsection (r) of this section, and shipping containers approved in accordance with subsection(cc)(8) of this section and been issued a registration letter.

(37) Registered transporter--A transporter that has an emergency plan approved in accordance with subsection (r) of this section, and proof of financial responsibility approved in accordance with subsection(e)(4) of this section and been issued a registration letter.

(38) Residual waste--LLRW resulting from processing or decontamination activities that cannot be easily separated into distinct batches attributable to specific waste generators. This waste is attributable to the processor or decontamination facility, as applicable.

(39) Shipper--The licensed entity (i.e., the waste generator, waste collector, or waste processor) who offers LLRW for transportation, typically consigning this type of waste to a licensed waste collector, waste processor, or land disposal facility operator. This definition applies only to shipments of LLRW shipped to a Texas LLRW disposal facility.

(40) Site of usage--The licensee's facility, including all buildings and structures between which radioactive material is transported and all roadways that are not within the public domain on which radioactive material can be transported.

(41) Specific activity of a radionuclide--The radioactivity of the radionuclide per unit mass of that nuclide. The specific activity of a material in which the radionuclide is essentially uniformly distributed is the radioactivity per unit mass of the material.

(42) Spent nuclear fuel or spent fuel--Fuel that has been withdrawn from a nuclear reactor following irradiation, has undergone at least 1 year's decay since being used as a source of energy in a power reactor, and has not been chemically separated into its constituent elements by reprocessing. Spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies.

(43) Surface contaminated object (SCO)--A solid object that is not itself classed as radioactive material, but which has radioactive material distributed on any of its surfaces. A SCO shall be in one of the following two groups with surface activity not exceeding the following limits:

(A) SCO-I--A solid object on which:

(i) the non-fixed contamination on the accessible surface averaged over 300 square centimeters ( $\text{cm}^2$ ) (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed 4 becquerels per square centimeter ( $\text{Bq}/\text{cm}^2$ ) ( $10^{-4}$  microcurie per square centimeter ( $\mu\text{Ci}/\text{cm}^2$ )) for beta and gamma and low toxicity alpha emitters, or  $4 \times 10^{-1} \text{ Bq}/\text{cm}^2$  ( $10^{-5} \mu\text{Ci}/\text{cm}^2$ ) for all other alpha emitters;

(ii) the fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \times 10^4 \text{ Bq}/\text{cm}^2$  ( $1 \mu\text{Ci}/\text{cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $4 \times 10^3 \text{ Bq}/\text{cm}^2$  ( $10^{-1} \mu\text{Ci}/\text{cm}^2$ ) for all other alpha emitters; and

(iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $4 \times 10^4 \text{ Bq/cm}^2$  ( $1 \text{ } \mu\text{Ci/cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $4 \times 10^3 \text{ Bq/cm}^2$  ( $10^{-1} \text{ } \mu\text{Ci/cm}^2$ ) for all other alpha emitters.

(B) SCO-II--A solid object on which the limits for SCO-I are exceeded and on which the following limits are not exceeded:

(i) the non-fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $400 \text{ Bq/cm}^2$  ( $10^{-2} \text{ } \mu\text{Ci/cm}^2$ ) for beta and gamma and low toxicity alpha emitters or  $40 \text{ Bq/cm}^2$  ( $10^{-3} \text{ } \mu\text{Ci/cm}^2$ ) for all other alpha emitters;

(ii) the fixed contamination on the accessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $8 \times 10^5 \text{ Bq/cm}^2$  ( $20 \text{ } \mu\text{Ci/cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $8 \times 10^4 \text{ Bq/cm}^2$  ( $2 \text{ } \mu\text{Ci/cm}^2$ ) for all other alpha emitters; and

(iii) the non-fixed contamination plus the fixed contamination on the inaccessible surface averaged over  $300 \text{ cm}^2$  (or the area of the surface if less than  $300 \text{ cm}^2$ ) does not exceed  $8 \times 10^5 \text{ Bq/cm}^2$  ( $20 \text{ } \mu\text{Ci/cm}^2$ ) for beta and gamma and low toxicity alpha emitters, or  $8 \times 10^4 \text{ Bq/cm}^2$  ( $2 \text{ } \mu\text{Ci/cm}^2$ ) for all other alpha emitters.

(44) Transporter--A carrier who transports radioactive material.

(45) Tribal official--The highest ranking individual that represents Tribal leadership, such as the Chief, President, or Tribal Council leadership.

(46) Uniform Low-Level Radioactive Waste Manifest or uniform manifest--The combination of NRC Forms 540, 541, and, if necessary, 542, and their respective continuation sheets as needed, or equivalent.

(47) Unirradiated uranium--Uranium containing not more than  $2 \times 10^3 \text{ Bq}$  of plutonium per gram of uranium-235, not more than  $9 \times 10^6 \text{ Bq}$  of fission products per gram of uranium-235, and not more than  $5 \times 10^{-3} \text{ g}$  of uranium-236 per gram of uranium-235.

(48) Uranium--Natural, depleted, enriched:

(A) Natural uranium--Uranium with the naturally occurring distribution of uranium isotopes (approximately 0.711 weight percent uranium-235, and the remainder by weight essentially uranium-238).

(B) Depleted uranium--Uranium containing less uranium-235 than the naturally occurring distribution of uranium isotopes.

(C) Enriched uranium--Uranium containing more uranium-235 than the naturally occurring distribution of uranium isotopes.

(49) Waste collector--An entity, operating in accordance with an NRC, agreement state, or agency license, whose principal purpose is to collect and consolidate waste generated by others, and to transfer this waste, without processing or repackaging the collected waste, to another licensed waste collector, licensed waste processor, or licensed land disposal facility.

(50) Waste description--The physical, chemical and radiological description of a LLRW as called for on NRC Form 541.

(51) Waste generator--An entity, operating in accordance with an NRC, agreement state, or agency license, who:

(A) possesses any material or component that contains radioactivity or is radioactively contaminated for which the licensee foresees no further use; and

(B) transfers this material or component to a licensed land disposal facility or to a licensed waste collector or processor for handling or treatment prior to disposal. A licensee performing processing or decontamination services may be a waste generator if the transfer of LLRW from its facility is defined as residual waste.

(52) Waste processor--An entity, operating in accordance with an NRC or agreement state license, whose principal purpose is to process, repackage, or otherwise treat LLRW or waste generated by others prior to eventual transfer of waste to a licensed LLRW land disposal facility.

(53) Waste type--A waste within a disposal container having a unique physical description (i.e., a specific waste descriptor code or description; or a waste sorbed on or solidified in a specifically-defined media).

(e) Transportation of radioactive material.

(1) - (3) (No change.)

(4) Transporter proof of financial responsibility.

(A) Transporters of low-level radioactive waste to a Texas low-level radioactive waste disposal site shall submit proof of financial responsibility required by Title 49, CFR, §387.7 and §387.9, to the agency [**agency's Radiation Safety Licensing Branch**] and receive a registration letter from the agency prior to initial shipment.

(B) The transporter registration expires on the expiration date of the proof of financial responsibility or in 10 years if the proof of financial responsibility does not have an expiration date.

(C) To renew their registration the transporter shall submit their new proof of financial responsibility [**5 days prior to the expiration date**].

(D) The transporter shall submit new proof of financial responsibility any time the amount of liability coverage is reduced or a new policy is purchased.

(5) (No change.)

(f) Exemption for low-level radioactive materials.

(1) (No change.)

(2) Common and contract carriers, freight forwarders, and warehousemen, and the United States Postal Service, are exempt from the regulations in this section to the extent that they transport or store radioactive material in the regular course of their carriage for another or storage incident thereto.

(3) (No change.)

(g) (No change.)

(h) Exemption from classification as fissile material. Fissile materials meeting the requirements of at least one of the paragraphs (1) through (6) of this subsection are exempt from classification as fissile material and from the fissile material package standards of Title 10, CFR §71.55 and §71.59, but are subject to all other requirements of this section, except as noted.

(1) - (3) (No change.)

(4) Uranium enriched in uranium-235 to a maximum of 1% by weight, and with total plutonium and uranium-233 content of up to 1% of the mass of uranium-235, provided that the mass of any beryllium, graphite, and hydrogenous material enriched in deuterium constitutes less than 5% of the uranium mass.

(5) Liquid solutions of uranyl nitrate enriched in uranium-235 to a maximum of 2% by mass, with a total plutonium and uranium-233 content not exceeding 0.002% of the mass of uranium, and with a minimum nitrogen to uranium atomic ratio (N/U) of 2. The material shall be contained in at least a DOT Type A package.

(6) Packages containing, individually, a total plutonium mass of not more than 1000 grams, of which not more than 20% by mass may consist of plutonium-239, plutonium-241, or any combination of these radionuclides.

(i) - (j) (No change.)

(k) Preliminary determinations. Before the first use of any packaging for the shipment of licensed material the licensee shall:

(1) (No change.)

(2) where the maximum normal operating pressure will exceed 35 kPa (5 lbf/in<sup>2</sup>) gauge, test the containment system at an internal pressure at least 50% higher than the maximum normal operating pressure, to verify the capability of that system to maintain its structural integrity at that pressure; and

(3) (No change.)

(l) - (n) (No change.)

(o) Records. For a period of 3 years after shipment, each licensee shall maintain, for inspection by the agency, a record of each shipment of radioactive material showing the following where applicable:

(1) - (8) (No change.)

(p) Reports. The transporter and shipper shall immediately report by telephone, facsimile, or electronic media transmission, all radioactive waste transportation accidents to the agency and the local emergency planning committees in the county where the radioactive waste accident occurs. All other accidents involving radioactive material shall be reported in accordance with §289.202(xx) and (yy) of this title.

(q) Advance notification of transport of irradiated reactor fuel and certain radioactive waste.

(1) - (2) (No change.)

(3) Advanced notification is also required under this subsection for the shipment of licensed radioactive material, other than irradiated fuel, meeting the following three conditions:

(A) - (C) (No change.)

(4) The following are procedures for submitting advance notification:

(A) - (C) (No change.)

(D) The licensee shall retain a copy of the notification as a record for 3 years.

(5) - (7) (No change.)

(r) Emergency plan registration requirements.

(A) Each shipper and transporter of radioactive waste shall submit an emergency plan to the agency and receive a registration letter from the agency prior to initial shipment.

(B) A freight forwarder may submit an emergency plan in order to become a registered freight forwarder.

(C) Each shipper, transporter or freight forwarder applying for registration shall submit a Business Information Form (RC 252-1).

(D) Shipper and freight forwarder registrations expire 10 years from the date of issuance. New documentation shall be submitted to renew the registration at least 30 days prior to the expiration date.

(s) Quality assurance requirements.

(1) Purpose. This subsection describes quality assurance requirements applying to design, purchase, fabrication, handling, shipping, storing, cleaning, assembly, inspection, testing, operation, maintenance, repair, and modification of components of packaging that are important to safety.

(A) - (B) (No change.)

(C) The licensee, certificate holder, and applicant for a CoC are responsible for the following:

(i) (No change.)

(ii) the quality assurance provision which applies to its use of a packaging for the shipment of licensed material subject to subsections (s) - (bb) and (ee) of this section.

(2) - (4) (No change.)

(t) - (bb) (No change.)

(cc) Transfer for disposal and manifests.

(1) - (7) (No change.)

(8) Each shipper shall submit a list of approved shipping containers that they intend to use to ship LLRW to the Texas LLRW site for approval by the agency. If the shipper is

licensed in Texas and is the holder of a CoC they shall also submit procedures that comply with subsections (s), (t), and (v) - (bb) of this title.

(dd) Fees.

(1) - (2) (No change.)

(3) Money expended from the agency's Radiation and Perpetual Care Account to respond to accidents involving LLRW shall be reimbursed to the agency's Radiation and Perpetual Care Account by the responsible shipper or transporter **[according to rules adopted by the board]**.

(4) - (5) (No change)

(ee) - (ff) (No change.)