

Overview of HMR Changes in July 11, 2014 DOT Final Rule

Purpose: Harmonize with 2009 edition of IAEA TS-R-1 & other misc. updates

Effective Date: October 1, 2014

Delayed Compliance Date: July 13, 2015

<u>Affected Section</u>	<u>Summary of Changes</u>
171.7	<ul style="list-style-type: none">- change IAEA TS-R-1 edition from 1996 to “2009”- change ISO 2919 edition from 1980 to “1999”- remove all references for 20PF & 21PF overpacks and 2R vessels- clean up opening paragraph (a)(1) “General”
172.203(d)(2)	<ul style="list-style-type: none">- add requirement to list “special form” if not in proper shipping name
172.203(d)(3)	<ul style="list-style-type: none">- indicate maximum activity in each package during transport on shipping papers, this does not include daughter products that have half-lives less than 10 days and not greater than the parent- allow mass of each fissile nuclide for mixtures
172.203(d)(4)	<ul style="list-style-type: none">- word “Radioactive” is no longer required to be included with label category
172.310(b)	<ul style="list-style-type: none">- reduce package type marking size requirement to 12mm (0.47 in) from 13mm (0.5 in)
172.402(d)(1)	<ul style="list-style-type: none">- clarify exception of subsidiary labels for small quantities of other hazard classes meeting criteria in 173.4, 173.4a or 173.4b
172.403(d)	<ul style="list-style-type: none">- change reference of 173.428(d) to “173.428(e)” for EMPTY labeling
172.403(g)(2)	<ul style="list-style-type: none">- indicate maximum activity in each package during transport on labels, this does not include daughter products that have half lives less than 10 days and not greater than the parent- allow mass of each fissile nuclide for mixtures

- 172.504(e)
 - add class 7 placarding required in Table 1 for:
 - + unpackaged LSA-I or SCO-I per 173.427(c)
 - + shipments required to be “exclusive use” by 173.427 (LSA in general design), 173.441 (>200mrem/hr or TI >10), & 173.457 (Fissile conveyance with CSI >50)
 - + all sole-use closed vehicles for 173.443(d) contamination control
 - may need to reassess registration requirements under 49 CFR Part 107 and carrier requirements for CDLs, due to the additional placarding requirements
- 172.505(b)
 - remove reference to “low specific activity” UF₆
 - add “non-fissile, fissile-excepted, or fissile” UF₆ require subsidiary corrosive placards
- 173.4(a)(1)(iv)
 - removed redundant excepted package activity limits
- 173.4(b)
 - require mixed hazard class small quantities to *also* comply with class 7 excepted package requirements in “173.426(a) – (c)” as applicable
- 173.25(a)(4)
 - mark overpacks with “OVERPACK” if containing radioactive specification packages [Type A, Type B(U), Type B(M), Type IP-1, -2, -3] where markings are not visible
 - DOT noted there are no overpack marking requirements in Part 172 Subpart D
- 173.401(b)(4)
 - add phrase to natural materials and ore “which are either in their natural state, or which have only been processed for purposes other than for extraction of the radionuclides”
 - add “or determined in accordance with the requirements of 173.433”
- 173.401(b)(5)
 - add another class 7 exemption: a non-radioactive object with contamination on its surfaces below the contamination definition in 173.403
 - refer to DOT letter of interpretation 06-0274 issued in 2008 on contamination limits
- 173.403
 - Definitions
 - Contamination
 - revise for clarity and replace “phases” with “categories”
 - Criticality Safety Index
 - add “conveyance CSI” as the total sum of individual package CSIs
 - Fissile material
 - add reference to “exceptions in 173.453”
 - align with NRC’s wording for clarity and uniformity
 - Low Specific Activity
 - add “which is not fissile material or is excepted under 173.453, and...”

- LSA-I
 - remove “solid” to allow unirradiated natural or depleted uranium or natural thorium in liquid physical state
 - align with NRC’s wording for clarity and uniformity
- Package
 - add the word “Type” in front of each IP description
- Radiation level
 - add that determination is by summing all types of ionizing radiation – alpha, beta, gamma, neutron
- Uranium
 - modify “natural uranium” to show chemical separation as a subcategory
- 173.410(i)(3)
 - liquids by air must be able to withstand 95 kPa (13.8 psi) “plus the maximum normal operating pressure”
- 173.411
 - add the word “Type” in front of each IP description
 - replace packaging with “package”
- 173.411(b)(4)
 - change the term of tank container to “portable tank”
 - replace “designed to satisfy” & “designed to meet” with just “meets”
- 173.411(b)(4) & (5)
 - change 265 kPa equivalent from 37.1 psig to “38.4 psia”
- 173.411(b)(5)
 - remove allowed use of IM-101 & IM-102 portable tanks [may still use if meets 173.411(b)(4) requirements]
 - revise to add IAEA requirements for cargo tanks and tank cars
- 173.411(c)
 - change Type IP-2 & Type IP-3 documentation retention from “1 year” to “2 years”
- 173.412(f)
 - change pressure reduction from 3.6 psi corresponding to ≈34,000’ altitude to “60 kPa (8.7 psi)” corresponding to ≈13,800’ altitude
- 173.412(k)(3)
 - clarify secondary outer containment will retain liquids in a Type A package
- 173.415(a)
 - After January 1, 2017:
 - change Type A package documentation retention from 1 year to “2 years”
 - clarify documentation must include: material of construction, dimensions, weight, closure and closure materials of each item in the containment system, shielding and packing materials; and testing date, place of test, signature of testers, detailed description of each test including equipment used and any damage results to each item of the containment system, or testing analysis
 - DOT noted any additional shielding could change how the package performs and thus would need to be evaluated

- 173.416(c) - remove authorized use of DOT approved 6M, 20WC, 21WC packages
- add new option for NRC approved equivalent design per 10 CFR 71.41(d)
- 173.417 - remove references to DOT approved 20PF and 21PF overpacks in paragraphs (a)(3), (b)(3), and (b)(3)(ii) Table 3
- 173.417(c) - remove authorized use of DOT approved 6L, 6M, 1A2 packages for fissile material
- add new option for NRC approved equivalent design per 10 CFR 71.41(d)
- 173.420(a)(2)(ii) - remove paragraph to use DOT-106A multi-unit tank car tanks for UF₆
- 173.420(a)(3)(i) - change 200 psi to “200 psig”
- 173.420(a)(6) - change 14.7 psig to “14.7 psia”
- 173.420(e) - new paragraph: any 0.1 kg or more of UF₆ requires a UF₆ proper shipping name, so the corrosive hazard is communicated and removes the LSA option over 0.1 kg
- 173.421 - outline is revised: paragraph (a) is now an introduction paragraph and paragraphs (a)(1) – (a)(6) are redesignated as paragraphs (a) – (f)

- This may cause confusion in 173.4(b), 173.423(a)(2), 173.426(c), and 173.428(a) since these still reference the original subparagraphs in 173.421(a)
- 173.421(b) - moved exceptions to 172.203(d) or 172.204(c)(4) for hazardous waste or RQ to 173.422(e)
- 173.422 - add allowance for small quantities of other hazard classes meeting criteria in 173.4
- 173.422(a)(2) - add non-bulk excepted packages be marked “RQ” for any hazardous substance
- 173.422(e) - add exceptions to 172.202(a)(5), 172.202(a)(6), 172.203(d) or 172.204(c)(4) for excepted packages containing a hazardous waste or a hazardous substance
- 173.427(a) - replace packaged with “transported”
- remove confusing opening statement: “unless excepted by paragraph (c) or (d) of this section, must be packaged in accordance with paragraph (b) of this section and”
- 173.427(a)(6)(v) - clarify that all placarding requirements in Part 172 Subpart F must be met by replacing the word “vehicle” with “shipment”
- remove placarding exceptions for uranium and thorium ores

- 173.427(a)(6)(vi) - add labeling requirements for any subsidiary hazard classes present as required in 172.402(d) and thus also requires indicating any subsidiary hazard classes on shipping papers per 172.202(a)(3)
- 173.427(b) - add “or (d)” to include exception from paragraph (b) packaging requirements
- 173.427(b)(1) - add the word “Type” in front of each IP description
- 173.427(b)(4) - reworded for clarity
- removed references to “173.24, 173.24a” to reference only 173.410
- 173.427(b)(5) - remove references to DOT tanks
- add reference to 173.411(b)(4) and (5) portable tanks, cargo tanks and tank cars
- 173.427(c)(3) - add the phrase “reasonable to suspect” that non-fixed contamination exists . . .
- the shipper must have a justifiable reason why it is not necessary to take measures to ensure that contamination from SCO-I will not be released
- 173.427(c)(4) - new paragraph requiring placarding highway or rail unpackaged LSA-I or SCO-I
- Table 5 - add 3rd column for inland waterway conveyance limits
- Table 6 - add the word “Type” in front of each IP description
- 173.433(b) - add to use Tables 7 & 8 for “which no relevant data are available”
- 173.433(c) - add calculating A_1A_2 values require DOT or Competent Authority approval
- 173.433(c)(1) - replace “related to its solubility class” with “calculated using a dose coefficient for the appropriate lung absorption type” for nuclides not listed in the A_1A_2 table
- 173.433(d)(3) - correct references to paragraphs “(d)(1) and (d)(2)” vice “(d)(2) and (d)(3)”
- Table 7 - add “but no beta, gamma, or neutron emitters” to line 2 alpha emitting nuclides
- add “neutron emitting nuclides or” with line 3 no relevant data are available
- add footnote for mixed (alpha with beta or gamma) emitters to use the lower default A_1 value 0.1 TBq (2.7 Ci)
- Table 8 - add “but no neutron emitters” to line 2 alpha emitting nuclides
- add “neutron emitting nuclides or” with line 3 no relevant data are available

- 173.435
 - adopt IAEA Cf-252 A₁ values 0.1 TBq (2.7 Ci) and remove footnote (h)
 - modify footnote (c) for Ir-192 in special form only
 - add Kr-79 IAEA values and add its intrinsic specific activity
 - revise footnote (a) to reference IAEA Table 2 list of nuclides with <10 day t_{1/2} lives
 - DOT noted how they calculate the specific activity for the A₁A₂ table: the specific activity calculated from the relation specific activity in Bq/g = 0.693 times Avogadro's number divided by the half-life in seconds times the atomic mass

- 173.436
 - change Te-121m total consignment activity limit from 1E5 Bq (2.7E-6 Ci) to "1E6" Bq (2.7E-5 Ci)
 - add Kr-79 IAEA limits
 - remove decay chains for Ce-134, Rn-220, Th-226, U-240 in footnote (b)
 - add decay chain for Ag-108m in footnote (b)

- 173.443(a)
 - revise "reasonable" to "reasonably" for ALARA
 - add non-fixed contamination limits to interior and exterior surfaces of overpacks, freight containers & conveyances that have inner packages or receptacles of Class 7 material

- 173.443(a)(1)
 - add exclusion to internal surfaces of packages & internal surfaces of a conveyance, freight container, tank or IBC used for unpackaged exclusive use LSA-I or SCO-I
 - redesignated (a)(1) and (a)(2) to (a)(1)(i) and (a)(1)(ii) respectively

- 173.443(a)(2)
 - new paragraph to require non-exclusive use post transport surveys only if contamination is suspected

- Table 9
 - change dpm/cm² limits from "220" βγ and "22" α to "240" βγ and "24" α

- 173.443(b)
 - add non-fixed contamination up to 10x limits to interior surfaces of overpacks, freight containers, & conveyances during transportation

- 173.443(c)
 - clarify "return to service" is continued use for class 7 shipments, not free release
 - add fixed (<0.5 mrem/hr) and non-fixed (< Table 9) contamination surveys after all and every exclusive use shipment
 - add survey requirements to overpacks, freight containers, tanks, IBCs & conveyances
 - DOT noted "free release" of a package to transport other than class 7 material would be up to a facility's NRC, Agreement State and/or DOE license conditions

- 173.443(d)(4) - add new paragraph requiring placarding for sole use closed transport contamination control by highway or rail
- 173.443(e) - add new paragraph with actions to be taken for a leak or suspected leak of radioactive material during transportation
- 173.465(a) - clarify a successful test also meets 173.412(j) requirements
- 173.465(d)(i) - clarify to use five times the maximum design mass capacity for the stacking test
- 173.466(a) - clarify a successful test also meets 173.412(k) requirements
- 173.469
 - replace word edges with “edge” in (b)(2)(ii)
 - limit lead sheet thickness used for percussion test to 25 mm (1 inch) in (b)(2)(iii)
 - add authorization to use ISO 2919 Class 5 impact test for <500 g in (d)(1)
 - add new paragraph (e) to allow a continued use provision to prevent re-testing for the new heat test requirements in latest revision of ISO 2919
- 173.473
 - change Safety Series 6 to 2009 edition of “IAEA TS-R-1”
 - add US Competent Authority address for revalidation submission
- 173.476(a) - change Special Form documentation retention from “1 year” to “2 years”
- 173.477(a) - change UF₆ packages with >0.1kg documentation retention from “1 year” to “2 years”
- 174.700(e) - remove paragraph (e) for fissile material controlled shipments by rail
- 174.715(a) - modify to be consistent with 173.443(c) changes & clarifying “returned to service”
- 175.702(b) - combined paragraphs (b) & (c) into a new (b) for CSI total group limits
- 175.705(c) - clarify return to service for aircraft is exempt from class 7 definition in 173.403
- 176.715 - modify to be consistent with 173.443(c) changes for a vessel’s hold, compartment or deck used for LSA/SCO exclusive use & return to service
- 177.843(a) - modify to be consistent with 173.443(c) changes & clarifying “returned to service”
- 178.350(c) - add reference to 178.2 to ensure manufacturers provide closure instructions

178.356, 178.356-1 - remove authorization for DOT specification 20PF overpacks
thru 178.358-5

178.358, 178.358-1 - remove authorization for DOT specification 21PF overpacks
thru 178.358-6

178.360, 178.360-1 - remove authorization for DOT specification 2R inside containment vessel
thru 178.360-4