PARIS CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY

COMPILATION OF THE DECISIONS, RECOMMENDATIONS AND INTERPRETATIONS CONCERNING THE PARIS CONVENTION

PARIS 2022

OECD
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NEA
NUCLEAR ENERGY AGENCY

Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004

DECISIONS,

RECOMMENDATIONS,

INTERPRETATIONS

Compilation of the Decisions, Recommendations and Interpretations applicable to the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982 and by the Protocol of 12 February 2004

Unofficial consolidated text

NOTE BY THE SECRETARIAT OF THE PARIS CONVENTION

The Convention on Third Party Liability in the Field of Nuclear Energy (the "Paris Convention") was adopted on 29 July 1960 under the auspices of the OECD Nuclear Energy Agency (the "NEA"). It was then amended by the Additional Protocol of 28 January 1964 and came into force, along with its 1964 Additional Protocol, on 1 April 1968. It was further amended by the Protocol of 16 November 1982, entered into force on 7 October 1988, and most recently by the Protocol of 12 February 2004 which entered into force on 1 January 2022.

The Paris Convention was the first multilateral treaty to establish a special international regime for nuclear third party liability to deal with the particular risks involved in nuclear energy production and use, as many States considered at the time of its adoption that general tort law was not well suited to deal with such risks. The primary objectives of this special regime are threefold: first, to ensure adequate compensation of damage caused to persons, property and the environment by a nuclear accident; second, to make sure that nuclear operators, who are in the best position to ensure the safety of their nuclear installations and their transport activities, assume full responsibility for any breach of that safety while not being exposed to an excessive liability burden; and third, to ensure that those associated with the construction, operation or decommissioning of nuclear installations (such as builders or suppliers) are exempt from that liability. The regime established by the Paris Convention is based on the following principles: strict liability (or liability without fault) of the operator of the nuclear installation; exclusive liability of the operator; establishing a minimum amount of liability for the operator; limitation upon the operator's liability in time; and obligation on the operator to cover its liability by insurance or other financial security.[1]

Since the adoption of the Paris Convention, its Contracting Parties have worked to ensure that the liability regime it establishes is regularly updated to address the most recent needs. In this context, the adoption of the latest Protocol in 2004 to amend the Paris Convention addressed, among others, the necessity to increase the amounts of liability, to extend compensation for nuclear damage to a larger category of victims, to broaden the types of damage that were provided for in the existing nuclear liability regime and to extend the prescription period for bodily injury.

Moreover, decisions, recommendations and interpretations (referred to as "DRI") have been adopted, either by the OECD Council or by the Steering Committee for Nuclear Energy (the "Steering Committee") to further specify the scope of application of the Convention.

- **Decisions** under the Paris Convention are binding on the Contracting Parties and can only be taken in order to amend the definitions of "nuclear installation", "nuclear fuel" and "nuclear substances". Decisions can be taken by the OECD Council pursuant to its general powers under Article 5(a) of the OECD Convention[2] or by the Steering Committee of the NEA under Article 1(a)(ii), 1(a)(iii) and 1(b) of the Paris Convention.

- **Recommendations** under the Paris Convention are non-legally binding instruments and can relate to any of its provision in view to achieve harmonisation in the application of the Paris Convention, while leaving the matter in question to the appreciation of each Contracting Party, its legislators, authorities or courts. Recommendations can be adopted by the OECD Council and

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1 For more information on the Paris Convention, see www.oecd-nea.org/jcms/pl_20196/paris-convention-on-nuclear-third-party-liability.

2 For more information on the OECD Convention, see www.oecd.org/general/conventionontheorganisationforeconomicco-operationanddevelopment.htm.

by the Steering Committee under Article 5(b) of the OECD Convention and Articles 8(b)(i) and 10(b) of the NEA Statute,[3] respectively.

- **Interpretations** under the Paris Convention provide clarifications as to the meaning of specific provisions of the said Convention to support their implementation. Interpretations are adopted by the Steering Committee. They emerged from the practice as early as 1967 and are non-legally binding.

The present compilation of the DRI applicable to the Paris Convention aims at promoting a better understanding of that Convention and facilitating the task of those responsible for implementing it. A first version of the compilation was published in 1984 at the suggestion of the NEA Group of Governmental Experts on Nuclear Third Party Liability (currently the NEA Nuclear Law Committee). A revised version was published in 1990 and included all the DRI applicable as of 1st November 1990.[4] This version compiles the Paris Convention DRI applicable upon the entry into force of the latest Protocol of 12 February 2004.

These DRI apply to any Contracting Party to the Paris Convention for whom the 2004 Protocol entered into force. It should be noted that this revised version of the compilation no longer includes instruments which were included in previous versions but which were rendered obsolete by the entry into force of the 2004 Protocol amending the Paris Convention.

This document organises the DRI by article of the Paris Convention to which they relate. Explanatory notes by the Secretariat are added to explain the background of the DRI, when necessary. References to the official documents provided in each DRI correspond to the minutes of the meeting of the official body that adopted the concerned instrument and to the relevant explanatory note.

A list of the DRI by numbering of the Paris Convention articles and by their chronological order appears below for the reader's convenience.

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3 For more information on the NEA Statute, see www.oecd-nea.org/general/about/statute.html.

4 The 1990 compilation of the Paris Convention Decisions, Recommendations and Interpretations can be found at the following link: www.oecd-nea.org/jcms/pl_13058/paris-convention-decisions-recommendations-interpretations.

LIST OF DECISIONS, RECOMMENDATIONS AND INTERPRETATIONS CORRESPONDING TO THE PROVISIONS OF THE PARIS CONVENTION

A. List of DRI by numbering of the Paris Convention Articles

Article	DRI	Date	Item in document
1(a)(ii)	Interpretation	8.6.1967	1
1(a)(iv)	Recommendation	19.4.2018	2
1(b)	Decision	3.11.2016	3
1(b)	Decision	27.10.1977	4
1(b)	Decision	30.10.2014	5
1(b)	Decision	3.11.2016	6
2	Recommendation	25.4.1968	7
3(a)	Recommendation	8.4.1981	8
4(d)	Recommendation	8.10.2021	9
4(e)	Interpretation	8.10.2021	10
6(d)	Interpretation	8.10.2021	11
7(e)	Recommendation	25.4.1968	12
7(e)	Recommendation	8.10.2021	13
10(a)	Interpretation	19.10.1967	14

B. List of DRI by chronological order

Date	DRI	Article	Item in document
8.6.1967	Interpretation	1(a)(ii)	1
19.10.1967	Interpretation	10(a)	14
25.4.1968	Recommendation	2, 7(e)	7, 12
27.10.1977	Decision	1(b)	4
8.4.1981	Recommendation	3(a)	8
30.10.2014	Decision	1(b)	5
3.11.2016	Decision	1(b)	3, 6
19.4.2018	Recommendation	1(a)(iv)	2
8.10.2021	Recommendation	4(d)	9
8.10.2021	Interpretation	4(e), 6(d)	10, 11
8.10.2021	Recommendation	7(e)	13

PARIS CONVENTION

Article	Decisions, Recommendations and Interpretations
Article 1(a)(ii) **"Nuclear installation" means reactors other than those comprised in any means of transport; factories for the manufacture or processing of nuclear substances; factories for the separation of isotopes of nuclear fuel; factories for the reprocessing of irradiated nuclear fuel; facilities for the storage of nuclear substances other than storage incidental to the carriage of such substances; installations for the disposal of nuclear substances; any such reactor, factory, facility or installation that is in the course of being decommissioned; and such other installations in which there are nuclear fuel or radioactive products or waste as the Steering Committee for Nuclear Energy of the Organisation (hereinafter referred to as the "Steering Committee") shall from time to time determine; any Contracting Party may determine that two or more nuclear installations of one operator which are located on the same site shall, together with any other premises on that site where nuclear fuel or radioactive products or waste are held, be treated as a single nuclear installation.**	**1. DEFINITION OF "REACTOR"** ***Interpretation*** *of the Steering Committee of 8.6.1967 [NE/M(67)1 and NE(67)10]* "… sub-critical assemblies should not be included in the term 'reactor' within the meaning of Article 1(a)(ii) of the Paris Convention." ***Note by the Secretariat*** *This interpretation is consistent with the definition of "nuclear reactor" in the 1963 Vienna Convention and with the 1997 Protocol to amend the Vienna Convention.*

Article	Decisions, Recommendations and Interpretations
Article 1(a)(iv) **"Radioactive products or waste" means any radioactive material produced in or made radioactive by exposure to the radiation incidental to the process of producing or utilising nuclear fuel, but does not include (1) nuclear fuel, or (2) radioisotopes outside a nuclear installation which have reached the final stage of fabrication so as to be usable for any industrial, commercial, agricultural, medical, scientific or educational purpose.**	**2. DEFINITION OF "RADIOISOTOPES WHICH HAVE REACHED THE FINAL STAGE OF FABRICATION"** ***Recommendation*** *of the Steering Committee of 19.4.2018 [NEA/SUM(2018)1 and NEA/NE(2018)3/FINAL]* "The Steering Committee …… CONSIDERING that pursuant to Article 1(a)(iv) of the Paris Convention, radioisotopes outside a nuclear installation which have reached the final stage of fabrication so as to be usable for any industrial, commercial, agricultural, medical, scientific or educational purpose, are excluded from the scope of application of the Paris Convention; RECOMMENDS the following interpretation: The radioisotopes reach the final stage of fabrication, under Article 1(a)(iv) of the Paris Convention, when they may be used for any industrial, commercial, agricultural, medical, scientific or educational purpose. The radioisotopes which have reached the final stage of fabrication are excluded from the scope of application of the Paris Convention and shall not be made subject to it at a later stage." ***Note by the Secretariat*** *The Recommendation aims at strengthening the common understanding with regard to the definition of the term "final stage of fabrication" in Article 1(a)(iv) of the Paris Convention and with regard to the temporal effect of the exclusion of radioisotopes which have reached the final stage of fabrication. The principle is that once the radioisotopes have reached the final stage of fabrication and have left the nuclear installation where they reached that stage (i.e. the "nuclear installation of origin"), they will no longer be covered by the Paris Convention.*

Article	Decisions, Recommendations and Interpretations
Article 1(b) **The Steering Committee may, if in its view the small extent of the risks involved so warrants, exclude any nuclear installation, nuclear fuel, or nuclear substances from the application of this Convention.**	**3. EXCLUSION OF SMALL QUANTITIES OF NUCLEAR SUBSTANCES OUTSIDE A NUCLEAR INSTALLATION** ***Decision*** *of the Steering Committee of 3.11.2016 [NEA/SUM(2016)2 and NEA/NE(2016)8/FINAL], replacing a Decision of 18.10.2007* "The Steering Committee …… CONSIDERING that nuclear substances in transport or use outside a nuclear installation, within defined limits and under specifically prescribed conditions during transport, should, in view of the small extent of the risks involved, be excluded from the application of the Paris Convention; DECIDES: Nuclear substances which are consigned by an operator to a recipient for use shall be excluded from the application of the Paris Convention for the period during which they are outside a nuclear installation provided that the consignment, when leaving a nuclear installation, complies with the provisions set forth in the Annex[*] to this Decision and with other relevant requirements of the Regulations for the Safe Transport of Radioactive Material of the International Atomic Energy Agency." * Reprinted at the end of this text [Annex I]

Article	Decisions, Recommendations and Interpretations
Article 1(b) ***cont'd***	**4. EXCLUSION OF CERTAIN KINDS OF NUCLEAR SUBSTANCES** ***Decision*** *of the Steering Committee of 27.10.1977 [NE/M(77)2 and NE(77)20]* "The Steering Committee …… CONSIDERING that, certain nuclear substances, and in particular reprocessed uranium, should, within defined limits, be excluded from the application of the Paris Convention, in view of the small extent of the risks involved; DECIDES: Any substance consisting substantially of uranium in which a) the total activity content per gramme of that substance of all radioactive isotopes, other than any uranium isotopes which are normally present in natural uranium or any daughter products of such uranium isotopes i) does not exceed 200 000 alpha disintegrations per minute from all alpha emitting isotopes; and ii) does not exceed 20 microcuries (0.74 megabecquerels) from all beta or gamma emitting isotopes; and b) the mass of the isotope uranium 235 does not exceed 1 per cent of the total mass of all the uranium isotopes present shall not be considered to be a nuclear substance for the purposes of the Paris Convention. NOTES: As a consequence of this Decision a) there will be excluded from the application of the Paris Convention the following installations otherwise falling within the definition of "nuclear installation" in Article 1(a)(ii) of the Convention: i) factories in which the only nuclear substances manufactured or processed are substances excluded hereby from the application of the Convention; and ii) storage facilities in which the only nuclear substances stored are substances excluded hereby from the application of the Convention; b) the operator of a nuclear installation will not be liable, under the terms of the Paris Convention, for damage caused by an incident involving only nuclear substances excluded hereby in the course of carriage to or from that installation."

Article	Decisions, Recommendations and Interpretations
Article 1(b) ***cont'd***	**5. POSSIBILITY OF EXCLUDING INSTALLATIONS BEING DECOMMISSIONED** ***Decision*** *of the Steering Committee of 30.10.2014 [NEA/SUM(2014)2 and NEA/NE(2014)14/REV1], replacing a Decision of 20.4.1990* "The Steering Committee …….. DECIDES that any Contracting Party may cease to apply the Paris Convention to a nuclear installation in the process of being decommissioned, provided that the provisions set out in the Annex[*] to this Decision and Recommendation and any additional conditions which the Contracting Party may judge appropriate to establish are met; and RECOMMENDS that the Contracting Parties which make use of this option notify the other Contracting Parties, as well as the Secretariat of the OECD Nuclear Energy Agency." * Reprinted at the end of this text [Annex II]

Article	Decisions, Recommendations and Interpretations
Article 1(b) ***cont'd***	**6. POSSIBILITY OF EXCLUDING NUCLEAR INSTALLATIONS FOR THE DISPOSAL OF CERTAIN TYPES OF LOW-LEVEL RADIOACTIVE WASTE** **Decision** of the Steering Committee of *3.11.2016 [NEA/SUM(2016)2 and NEA/NE(2016)7/FINAL]* "The Steering Committee …….. CONSIDERING that, by virtue of that Article, the Steering Committee may, if in its view the small extent of the risks involved so warrants, exclude any nuclear installation, nuclear fuel or nuclear substances from the application of the Paris Convention; DECIDES that any Contracting Party may cease to apply the Paris Convention to a nuclear installation for the disposal of low-level radioactive waste, provided that the provisions set out in the Appendix[*] to this decision and Recommendation and any additional conditions which the Contracting Party may judge appropriate to establish are met; RECOMMENDS that the Contracting Parties which make use of this option notify the other Contracting Parties, as well as the Nuclear Energy Agency; and RECOMMENDS that the Nuclear Energy Agency, as appropriate, analyses periodically the experience gained by the Contracting Parties which use this option and reports back to all the Contracting Parties." ***Note by the Secretariat*** *Exclusion will apply only to installations for the disposal of certain types of solid low-level radioactive waste (LLW) or very low-level radioactive waste (VLLW). Typical LLW and VLLW to be considered here include soil and rubble with low levels of radioactive constituents from decommissioning of nuclear installations and other practices involving the use and management of radioactive materials.* * Reprinted at the end of this text [Annex III]

Article	Decisions, Recommendations and Interpretations
Article 2 ***a*) This Convention shall apply to nuclear damage suffered in the territory of, or in any maritime zones established in accordance with international law of, or, except in the territory of a non-Contracting State not mentioned under (*ii*) to (*iv*) of this paragraph, on board a ship or aircraft registered by,** ***i*) a Contracting Party;** ***ii*) a non-Contracting State which, at the time of the nuclear incident, is a Contracting Party to the Vienna Convention on Civil Liability for Nuclear Damage of 21 May 1963 and any amendment thereto which is in force for that Party, and to the Joint Protocol relating to the Application of the Vienna Convention and the Paris Convention of 21 September 1988, provided however, that the Contracting Party to the Paris Convention in whose territory the installation of the operator liable is situated is a Contracting Party to that Joint Protocol;** ***iii*) a non-Contracting State which, at the time of the nuclear incident, has no nuclear installation in its territory or in any maritime zones established by it in accordance with international law; or** ***iv*) any other non-Contracting State which, at the time of the nuclear incident, has in force nuclear liability legislation which affords equivalent reciprocal benefits, and which is based on principles identical to those of this Convention, including, inter alia, liability without fault of the operator liable, exclusive liability of the operator or a provision to the same effect, exclusive jurisdiction of the competent court, equal treatment of all victims of a nuclear incident, recognition and enforcement of judgements, free transfer of compensation, interests and costs.**	**7. TERRITORIAL SCOPE** ***Recommendation** of the Steering Committee of 25.4.1968 [NE/M(68)1 and NE(68) 5& Addendum]* "Signatory countries, in adopting measures to apply the Convention, should take [into account that] the Paris Convention is applicable to nuclear incidents occurring on the high seas or to damage suffered on the high seas."

Article	Decisions, Recommendations and Interpretations
Article 2 (*cont'd*) ***b*) Nothing in this Article shall prevent a Contracting Party in whose territory the nuclear installation of the operator liable is situated from providing for a broader scope of application of this Convention under its legislation.**	
Article 3(a) **The operator of a nuclear installation shall be liable, in accordance with this Convention, for nuclear damage other than:** ***i*) damage to the nuclear installation itself and any other nuclear installation, including a nuclear installation under construction, on the site where that installation is located; and** ***ii*) damage to any property on that same site which is used or to be used in connection with any such installation,** **upon proof that such damage was caused by a nuclear incident in such installation or involving nuclear substances coming from such installation, except as otherwise provided for in Article 4.**	**8. DAMAGE TO NUCLEAR SUBSTANCES IN THE COURSE OF CARRIAGE** ***Recommendation** of the Steering Committee of 8.4.1981 [NE/M(81)1 and NE(81)8], replacing the Recommendation of 19.10.1967* "The Steering Committee …….. NOTES that the Paris Convention makes no special provision with regard to third party liability for damage caused to nuclear substances in the course of carriage. However, it would appear to be within the spirit of the Convention that the liability of a nuclear operator should not extend to damage caused to nuclear substances belonging to other nuclear operators but for which the operator in question has assumed third party liability pursuant to a contract in writing or of which he has taken charge in accordance with Article 4 of the Convention; RECOMMENDS, therefore, to the Signatories, that a nuclear operator should not be held liable, within the meaning of the Paris Convention, for damage caused by a nuclear incident to nuclear substances in course of carriage belonging to other operators but for which he has assumed third party liability pursuant to a contract in writing or of which he has taken charge in accordance with Article 4 of the Convention; AGREES that adoption of this Recommendation has the effect of *annulling* the previous Recommendation on this point adopted by the Steering Committee for Nuclear Energy on the 19th October 1967."

Article	Decisions, Recommendations and Interpretations
Article 4(d) **The operator liable in accordance with this Convention shall provide the carrier with a certificate issued by or on behalf of the insurer or other financial guarantor furnishing the security required pursuant to Article 10. However, a Contracting Party may exclude this obligation in relation to carriage which takes place wholly within its own territory. The certificate shall state the name and address of that operator and the amount, type and duration of the security, and these statements may not be disputed by the person by whom or on whose behalf the certificate was issued. The certificate shall also indicate the nuclear substances and the carriage in respect of which the security applies and shall include a statement by the competent public authority that the person named is an operator within the meaning of this Convention.**	**9. OPERATOR'S CERTIFICATE OF FINANCIAL SECURITY** ***Recommendation*** *of the Steering Committee of 8.10.2021 [NEA/SUM/DEC(2021)2 and NEA/NE(2021)14, Annex 2, Appendix A]** "The Steering Committee recommends… that Signatory countries to the Paris Convention establish the certificates of financial security provided for in Article 4(d) of the Convention according to the model attached to this Recommendation."** ***Note by the Secretariat*** *This model certificate, which is in strict conformity with the provisions of the Convention, was proposed to simplify matters for national authorities and operators, in particular in relation to international transport.* * This Recommendation replaced the Recommendation of 8.6.1967 [NE/M(67)1 and NE(67)9] ** Reprinted at the end of this text [Annex IV]

Article	Decisions, Recommendations and Interpretations
Article 4(e) **A Contracting Party may provide by legislation that, under such terms as may be contained therein and upon fulfilment of the requirements of Article 10(a), a carrier may, at his request and with the consent of an operator of a nuclear installation situated in its territory, by decision of the competent public authority, be liable in accordance with this Convention in place of that operator. In such case for all the purposes of this Convention the carrier shall be considered, in respect of nuclear incidents occurring in the course of carriage of nuclear substances, as an operator of a nuclear installation on the territory of the Contracting Party whose legislation so provides.**	**10. SUBSTITUTION OF A CARRIER FOR THE OPERATOR** ***Interpretation*** *approved by the Steering Committee on 8.10.2021 [NEA/SUM/DEC(2021)2 and NEA/NE(2021)14, Annex 2, Appendix B]** "Whether or not any Contracting Party itself makes use of the provisions of Article 4(e) of the Paris Convention or Article II(2) of the Vienna Convention, all Contracting Parties must legally recognise a carrier, who is properly substituted for the operator of a nuclear installation situated in one of the Contracting Parties' countries, as an operator for all the purposes of the Conventions, even if they do not themselves provide for such substitution for their own operators." ***Note by the Secretariat*** *A similar Recommendation was adopted on 28 October 1965 by Euratom, see Commission Recommendation of 28 October 1965 to the Member States on the harmonization of legislation applying the Paris Convention of 29 July 1960 and the Brussels Supplementary Convention of 31 January 1963; OJ 196, 18.11.1965, pp. 2995-2996.* * This Interpretation replaced the Interpretation of 22.4.1971 [NE/M(71)1 and NE(71)4]
Article 6(d) **Any person who has paid compensation in respect of damage caused by a nuclear incident under any international agreement referred to in paragraph (b) of this Article or under any legislation of a non-Contracting State shall, up to the amount which he has paid, acquire by subrogation the rights under this Convention of the person suffering damage whom he has so compensated.**	**11. RIGHTS OF SUBROGATION OF A CARRIER** ***Interpretation*** *approved by the Steering Committee on 8.10.2021 [NEA/SUM/DEC(2021)2 and NEA/NE(2021)14, Annex 2, Appendix C]** "When a carrier accepts the obligations of an operator by being substituted for him in accordance with Article 4(e) of the Convention, he thereby renounces the taking of advantage of the right of subrogation given to a carrier against the operator by Article 6(d)." * This Interpretation replaced the Interpretation of 22.4.1971 [NE/M(71)1 and NE(71)4]

Article	Decisions, Recommendations and Interpretations
Article 7(e) **A Contracting Party may subject the transit of nuclear substances through its territory to the condition that the maximum amount of liability of the foreign operator concerned be increased, if it considers that such amount does not adequately cover the risks of a nuclear incident in the course of the transit, provided that the maximum amount thus increased shall not exceed the maximum amount of liability of operators of nuclear installations situated in its territory.**	**12. NUCLEAR SUBSTANCES IN TRANSIT** ***Recommendation*** *of the Steering Committee of 25.4.1968 [NE/M(68)1 and NE(68)5 & Addendum]* *"*Where a Contracting Party to the Paris Convention makes use of Article 7(e) thereof to subject the transit of nuclear substances through its territory to the condition that the maximum amount of liability of the foreign operator concerned be increased, the maximum total liability for a nuclear incident occurring in the territory of that country will be the higher amount thus required pursuant to Article 7(e) or, if the incident occurred elsewhere, the amount originally established by the installation State as the maximum liability of that operator." ***Note by the Secretariat*** *This Recommendation was adopted to clarify the effect of exercising the option in Article 7(e) and thus simplify the issue of insurance policies for the transport of nuclear substances. This Article had caused certain problems for insurers since, depending on the interpretation given, uncertainty could have resulted as to the total amount of the operator's liability.*

Article	Decisions, Recommendations and Interpretations
	13. NUCLEAR SUBSTANCES IN TRANSIT ***Recommendation*** *of the Steering Committee of 8.10.2021 [NEA/SUM/DEC(2021)2 and NEA/NE(2021)14, Annex 2, Appendix D]** "The Contracting Parties to the Paris Convention should precede any new use of Article 7(e) by an examination carried out, either within the Nuclear Law Committee, or within the framework of bilateral discussions with the countries concerned." ***Note by the Secretariat*** *In spite of the Recommendation of 25th April 1968 (above) clarifying this point, it emerged that the application of Article 7(e) still raised certain difficulties due to the fact that the decision to fix the amount of liability of the nuclear operator is generally considered as being a matter exclusively for the legislation of the country where the installation of that operator is situated. Consequently, it would be preferable for each Contracting Party, before it makes use of Article 7(e) in its national legislation, to examine, with the countries concerned, the problems likely to result therefrom.* * This Recommendation replaced the Recommendation of 22.4.1971 [NE/M(71)1 and NE(71)4]
Article 10(a) **To cover the liability under this Convention, the operator shall be required to have and maintain insurance or other financial security of the amount established pursuant to Article 7(*a*) or 7(*b*) or Article 21(*c*)** **and of such type and terms as the competent public authority shall specify.**	**14. FINANCIAL SECURITY FOR THE OPERATOR'S LIABILITY** ***Interpretation*** *(following the Recommendation of Euratom of 28.10.1965) approved by the Steering Committee on 19.10.1967 [NE/M(67)2 and NE(67)25]* "The obligation which arises from the financial security referred to in Article 10(a) of the Paris Convention, intended to cover liability for the purpose of Articles 3 and 4 thereof, shall not be altered by the fact that the damage is already covered by other insurance or financial security on the understanding that this does not affect the provisions of Article 6(h) of the Convention."

ANNEXES

Annex I

ANNEX TO THE DECISION ON THE EXCLUSION OF SMALL QUANTITIES OF NUCLEAR SUBSTANCES OUTSIDE A NUCLEAR INSTALLATION FROM THE APPLICATION OF THE CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY

1. General

The definitions in this Annex are contained in Part I of the Appendix, which reproduces Section II of the Regulations for the Safe Transport of Radioactive Material of the International Atomic Energy Agency.

2. Provisions applicable to all radionuclides

2.1 Consignments containing a single radionuclide with a total activity that is below the threshold value of 100 A_2 per conveyance are excluded from the application of the Paris Convention.

2.2 Consignments containing mixtures of radionuclides, the identity and activity of which are known, and with a total activity per conveyance below the threshold criteria given below, are excluded from the application of the Paris Convention:

$$\sum_{i} \frac{B(i)}{100 \times A_2(i)} < 1$$

where B(i) is the activity of the radionuclide i contained in radioactive material and $A_2(i)$ is the A_2 value for the radionuclide i.

2.3 In the case of consignments containing individual radionuclides or mixtures of radionuclides which are not known or for which relevant data are not available, the formula as set out in 2.2 above shall be applied by using the A_2 values given in Table 3 of Part II of the Appendix. Part II of the Appendix reproduces Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.

3. Specific additional provisions for fissile material

3.1 Subject to 3.2 below, fissile material is governed by the provisions of the Paris Convention.

3.2 Consignments of fissile material excepted from classification as “fissile” pursuant to the provisions of Part III of the Appendix are excluded from the application of the Paris Convention. Part III of the Appendix reproduces paragraphs 417 (a) to (f) of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.

APPENDIX

PART I

Section II

DEFINITIONS[1]

The following definitions shall apply for the purposes of these Regulations:

A_1 and A_2

201. *A_1* shall mean the activity value of *special form radioactive material* that is listed in Table 2 or derived in Section IV and is used to determine the activity limits for the requirements of these Regulations. *A_2* shall mean the activity value of *radioactive material,* other than *special form radioactive material* that is listed in Table 2 or derived in Section IV and is used to determine the activity limits for the requirements of these Regulations.

Aircraft

202. *Cargo aircraft* shall mean any *aircraft,* other than a *passenger aircraft,* that is carrying goods or property.

203. *Passenger aircraft* shall mean an *aircraft* that carries any person other than a crew member, a *carrier's* employee in an official capacity, an authorized representative of an appropriate national authority, or a person accompanying a *consignment* or other cargo.

Approval

204. *Multilateral approval* shall mean *approval* by the relevant *competent authority* of the country of origin of the *design* or *shipment,* as applicable, and also, where the *consignment* is to be transported *through or into* any other country, *approval* by the *competent authority* of that country.

205. *Unilateral approval* shall mean an *approval* of a *design* that is required to be given by the *competent authority* of the country of origin of the *design* only.

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[1] References in these Definitions to Table 2 are references to Table 2 of Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency as reproduced in Part II of the Appendix.
References in these Definitions to Section IV are references to Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency as reproduced in Part II of the Appendix.
Reference in these Definitions to paragraphs 402-407 is a reference to paragraphs 402-407 of Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency as reproduced in Part II of the Appendix.
References in these Definitions to "these Regulations" are references to the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.
References in these Definitions to paragraph 417(f) are references to paragraph 417(f) of Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.

SECTION II

Carrier

206. *Carrier* shall mean any person, organization or government undertaking the carriage of *radioactive material* by any *means of transport.* The term includes both *carriers* for hire or reward (known as common or contract carriers in some countries) and *carriers* on own account (known as private *carriers* in some countries).

Competent authority

207. *Competent authority* shall mean any body or authority designated or otherwise recognized as such for any purpose in connection with these Regulations.

Compliance assurance

208. *Compliance assurance* shall mean a systematic programme of measures applied by a *competent authority* that is aimed at ensuring that the provisions of these Regulations are met in practice.

Confinement system

209. *Confinement system* shall mean the assembly of *fissile material* and *packaging* components specified by the designer and agreed to by the *competent authority* as intended to preserve criticality safety.

Consignee

210. *Consignee* shall mean any person, organization or government that is entitled to take delivery of a *consignment*.

Consignment

211. *Consignment* shall mean any *package* or *packages*, or load of *radioactive material*, presented by a *consignor* for transport.

Consignor

212. *Consignor* shall mean any person, organization or government that prepares a *consignment* for transport.

Containment system

213. *Containment system* shall mean the assembly of components of the *packaging* specified by the designer as intended to retain the *radioactive material* during transport.

Contamination

214. *Contamination* shall mean the presence of a radioactive substance on a surface in quantities in excess of 0.4 Bq/cm^2 for beta and gamma emitters and *low toxicity alpha emitters*, or 0.04 Bq/cm^2 for all other alpha emitters.

215. *Non-fixed contamination* shall mean *contamination* that can be removed from a surface during routine conditions of transport.

216. *Fixed contamination* shall mean *contamination* other than *non-fixed contamination*.

Conveyance

217. *Conveyance* shall mean:

(a) For transport by road or rail: any *vehicle*.
(b) For transport by water: any *vessel*, or any hold, compartment, or *defined deck area* of a *vessel*.
(c) For transport by air: any *aircraft*.

Criticality safety index

218. *Criticality safety index* (*CSI*) assigned to a *package*, *overpack* or *freight container* containing *fissile material* shall mean a number that is used to provide control over the accumulation of *packages*, *overpacks* or *freight containers* containing *fissile material*.

Defined deck area

219. *Defined deck area* shall mean the area of the weather deck of a *vessel*, or of a *vehicle* deck of a roll-on/roll-off ship or ferry, that is allocated for the stowage of *radioactive material*.

Design

220. *Design* shall mean the description of *fissile material* excepted under para. 417(f), *special form radioactive material*, *low dispersible radioactive material*, *package* or *packaging* that enables such an item to be fully identified. The description may include specifications, engineering drawings, reports

demonstrating compliance with regulatory requirements, and other relevant documentation.

Exclusive use

221. *Exclusive use* shall mean the sole use, by a single *consignor*, of a *conveyance* or of a *large freight container*, in respect of which all initial, intermediate and final loading and unloading and *shipment* are carried out in accordance with the directions of the *consignor* or *consignee*, where so required by these Regulations.

Fissile nuclides and *fissile material*

222. *Fissile nuclides* shall mean uranium-233, uranium-235, plutonium-239 and plutonium-241. *Fissile material* shall mean a material containing any of the *fissile nuclides*. Excluded from the definition of *fissile material* are the following:

(a) *Natural uranium* or *depleted uranium* that is unirradiated;
(b) *Natural uranium* or *depleted uranium* that has been irradiated in thermal reactors only;
(c) Material with *fissile nuclides* less than a total of 0.25 g;
(d) Any combination of (a), (b) and/or (c).

These exclusions are only valid if there is no other material with *fissile nuclides* in the *package* or in the *consignment* if shipped unpackaged.

Freight container — small, large

223. *Freight container* shall mean an article of transport equipment that is of a permanent character and accordingly strong enough to be suitable for repeated use; specially designed to facilitate the transport of goods, by one or other modes of transport, without intermediate reloading, designed to be secured and/or readily handled, having fittings for these purposes. The term "*freight container*" does not include the *vehicle*.

A *small freight container* shall mean a *freight container* that has an internal volume of not more than 3 m^3. A *large freight container* shall mean a *freight container* that has an internal volume of more than 3 m^3.

Intermediate bulk container

224. *Intermediate bulk container* (*IBC*) shall mean a portable *packaging* that:

(a) Has a capacity of not more than 3 m^3;
(b) Is designed for mechanical handling;
(c) Is resistant to the stresses produced in handling and transport, as determined by tests.

Low dispersible radioactive material

225. *Low dispersible radioactive material* shall mean either a solid *radioactive material* or a solid *radioactive material* in a sealed capsule, that has limited dispersibility and is not in powder form.

Low specific activity material

226. *Low specific activity (LSA) material* shall mean *radioactive material* that by its nature has a limited *specific activity*, or *radioactive material* for which limits of estimated average *specific activity* apply. External shielding materials surrounding the *LSA material* shall not be considered in determining the estimated average *specific activity*.

Low toxicity alpha emitters

227. *Low toxicity alpha emitters* are: *natural uranium*, *depleted uranium*, natural thorium, uranium-235, uranium-238, thorium-232, thorium-228 and thorium-230 when contained in ores or physical and chemical concentrates; or alpha emitters with a half-life of less than 10 days.

Management system

228. *Management system* shall mean a set of interrelated or interacting elements (system) for establishing policies and objectives and enabling the objectives to be achieved in an efficient and effective manner.

Maximum normal operating pressure

229. *Maximum normal operating pressure* shall mean the maximum pressure above atmospheric pressure at mean sea level that would develop in the *containment system* in a period of one year under the conditions of temperature

and solar radiation corresponding to environmental conditions in the absence of venting, external cooling by an ancillary system, or operational controls during transport.

Overpack

230. *Overpack* shall mean an enclosure used by a single *consignor* to contain one or more *packages* and to form one unit for convenience of handling and stowage during transport.

Package

231. *Package* shall mean the complete product of the packing operation, consisting of the *packaging* and its contents prepared for transport. The types of *package* covered by these Regulations that are subject to the activity limits and material restrictions of Section IV and meet the corresponding requirements are:

(a) *Excepted package*;
(b) *Industrial package Type 1 (Type IP-1)*;
(c) *Industrial package Type 2 (Type IP-2)*;
(d) *Industrial package Type 3 (Type IP-3)*;
(e) *Type A package*;
(f) *Type B(U) package*;
(g) *Type B(M) package*;
(h) *Type C package*.

Packages containing *fissile material* or uranium hexafluoride are subject to additional requirements.

Packaging

232. *Packaging* shall mean one or more receptacles and any other components or materials necessary for the receptacles to perform the containment and other safety functions.

Radiation level

233. *Radiation level* shall mean the corresponding dose rate expressed in millisieverts per hour or microsieverts per hour.

Radiation protection programme

234. *Radiation protection programme* shall mean systematic arrangements that are aimed at providing adequate consideration of radiation protection measures.

Radioactive contents

235. *Radioactive contents* shall mean the *radioactive material* together with any contaminated or activated solids, liquids and gases within the *packaging*.

Radioactive material

236. *Radioactive material* shall mean any material containing radionuclides where both the activity concentration and the total activity in the *consignment* exceed the values specified in paras 402–407.

Shipment

237. *Shipment* shall mean the specific movement of a *consignment* from origin to destination.

Special arrangement

238. *Special arrangement* shall mean those provisions, approved by the *competent authority*, under which *consignments* that do not satisfy all the applicable requirements of these Regulations may be transported.

Special form radioactive material

239. *Special form radioactive material* shall mean either an indispersible solid *radioactive material* or a sealed capsule containing *radioactive material*.

Specific activity

240. *Specific activity* of a radionuclide shall mean the activity per unit mass of that nuclide. The *specific activity* of a material shall mean the activity per unit mass of the material in which the radionuclides are essentially uniformly distributed.

Surface contaminated object

241. *Surface contaminated object (SCO)* shall mean a solid object that is not itself radioactive but which has *radioactive material* distributed on its surface.

Tank

242. *Tank* shall mean a portable *tank* (including a *tank* container), a road *tank vehicle*, a rail *tank* wagon or a receptacle that contains solids, liquids, or gases, having a capacity of not less than 450 L when used for the transport of gases.

Through or into

243. *Through or into* shall mean *through or into* the countries in which a *consignment* is transported but specifically excludes countries over which a *consignment* is carried by air, provided that there are no scheduled stops in those countries.

Transport index

244. *Transport index* (*TI*) assigned to a *package*, *overpack* or *freight container*, or to unpackaged *LSA-I* or *SCO-I*, shall mean a number that is used to provide control over radiation exposure.

Unirradiated thorium

245. *Unirradiated thorium* shall mean thorium containing not more than 10^{-7} g of uranium-233 per gram of thorium-232.

Unirradiated uranium

246. *Unirradiated uranium* shall mean *uranium* containing not more than 2×10^3 Bq of plutonium per gram of uranium-235, not more than 9×10^6 Bq of fission products per gram of uranium-235 and not more than 5×10^{-3} g of uranium-236 per gram of uranium-235.

Uranium — natural, depleted, enriched

247. *Natural uranium* shall mean *uranium* (which may be chemically separated) containing the naturally occurring distribution of *uranium* isotopes (approximately 99.28% uranium-238 and 0.72% uranium-235, by mass).

Depleted uranium shall mean *uranium* containing a lesser mass percentage of uranium-235 than *natural uranium*. *Enriched uranium* shall mean *uranium* containing a greater mass percentage of uranium-235 than 0.72%. In all cases, a very small mass percentage of uranium-234 is present.

Vehicle

248. *Vehicle* shall mean a road *vehicle* (including an articulated *vehicle*, i.e. a tractor and semi-trailer combination), railroad car or railway wagon. Each trailer shall be considered as a separate *vehicle*.

Vessel

249. *Vessel* shall mean any seagoing *vessel* or inland waterway craft used for carrying cargo.

APPENDIX

PART II

Section IV

ACTIVITY LIMITS AND CLASSIFICATION[2]

GENERAL PROVISIONS

401. *Radioactive material* shall be assigned to one of the UN numbers specified in Table 1 in accordance with paras 408-434.

BASIC RADIONUCLIDE VALUES

402. The following basic values for individual radionuclides are given in Table 2:

(a) A_1 and A_2 in TBq;
(b) Activity concentration limits for exempt material in Bq/g;
(c) Activity limits for exempt consignments in Bq.

DETERMINATION OF BASIC RADIONUCLIDE VALUES

403. For individual radionuclides:

(a) That are not listed in Table 2, the determination of the basic radionuclide values referred to in para. 402 shall require multilateral approval. For these radionuclides, activity concentrations for exempt material and activity limits for exempt consignments shall be calculated in accordance with the principles established in the BSS [2]. It is permissible to use an A_2 value calculated using a dose coefficient for the appropriate lung absorption type, as recommended by the International Commission on Radiological Protection, if the chemical forms of each radionuclide under both normal and accident conditions of transport are taken into consideration. Alternatively, the radionuclide values in Table 3 may be used without obtaining competent authority approval.

(b) In instruments or articles in which the radioactive material is enclosed in or is included as a component part of the instrument or other manufactured article and which meets para. 423 (c), alternative basic radionuclide values to those in Table 2 for the activity limit for an exempt consignment are permitted and shall require multilateral approval. Such alternative activity limits for an exempt consignment shall be calculated in accordance with the principles set out in the BSS [2].

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[2] Reference in this Appendix Part II to paragraphs 408-434 is a reference to paragraphs 408-434 of Section IV of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.

TABLE 1. EXCERPTS FROM THE LIST OF UN NUMBERS, PROPER SHIPPING NAMES AND DESCRIPTIONS

Assignment of UN numbers	PROPER SHIPPING NAME and description[a]
Excepted package	
UN 2908	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE — EMPTY PACKAGING
UN 2909	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE — ARTICLES MANUFACTURED FROM NATURAL URANIUM or DEPLETED URANIUM or NATURAL THORIUM
UN 2910	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE — LIMITED QUANTITY OF MATERIAL
UN 2911	RADIOACTIVE MATERIAL, EXCEPTED PACKAGE — INSTRUMENTS or ARTICLES
UN 3507	URANIUM HEXAFLUORIDE, RADIOACTIVE MATERIAL, EXCEPTED PACKAGE, less than 0.1 kg per package, non-fissile or fissile-excepted[b]
Low specific activity material	
UN 2912	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-I), non-fissile or fissile-excepted[b]
UN 3321	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), non-fissile or fissile-excepted[b]
UN 3322	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), non-fissile or fissile-excepted[b]
UN 3324	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-II), FISSILE
UN 3325	RADIOACTIVE MATERIAL, LOW SPECIFIC ACTIVITY (LSA-III), FISSILE
Surface contaminated objects	
UN 2913	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), non-fissile or fissile-excepted[b]
UN 3326	RADIOACTIVE MATERIAL, SURFACE CONTAMINATED OBJECTS (SCO-I or SCO-II), FISSILE

TABLE 1. EXCERPTS FROM THE LIST OF UN NUMBERS, PROPER SHIPPING NAMES AND DESCRIPTIONS (cont.)

Assignment of UN numbers	PROPER SHIPPING NAME and description[a]
Type A package	
UN 2915	RADIOACTIVE MATERIAL, TYPE A PACKAGE, non-special form, non-fissile or fissile-excepted[b]
UN 3327	RADIOACTIVE MATERIAL, TYPE A PACKAGE, FISSILE, non-special form
UN 3332	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, non-fissile or fissile-excepted[b]
UN 3333	RADIOACTIVE MATERIAL, TYPE A PACKAGE, SPECIAL FORM, FISSILE
Type B(U) package	
UN 2916	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, non-fissile or fissile-excepted[b]
UN 3328	RADIOACTIVE MATERIAL, TYPE B(U) PACKAGE, FISSILE
Type B(M) package	
UN 2917	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, non-fissile or fissile-excepted[b]
UN 3329	RADIOACTIVE MATERIAL, TYPE B(M) PACKAGE, FISSILE
Type C package	
UN 3323	RADIOACTIVE MATERIAL, TYPE C PACKAGE, non-fissile or fissile-excepted[b]
UN 3330	RADIOACTIVE MATERIAL, TYPE C PACKAGE, FISSILE
Special arrangement	
UN 2919	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, non-fissile or fissile-excepted[b]
UN 3331	RADIOACTIVE MATERIAL, TRANSPORTED UNDER SPECIAL ARRANGEMENT, FISSILE
Uranium hexafluoride	
UN 2977	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, FISSILE

TABLE 1. EXCERPTS FROM THE LIST OF UN NUMBERS, PROPER SHIPPING NAMES AND DESCRIPTIONS (cont.)

Assignment of UN numbers	PROPER SHIPPING NAME and description[a]
UN 2978	RADIOACTIVE MATERIAL, URANIUM HEXAFLUORIDE, non-fissile or fissile-excepted[b]

[a] The "PROPER SHIPPING NAME" is found in the column "PROPER SHIPPING NAME and description" and is restricted to that part shown in CAPITAL LETTERS. In the cases of UN 2909, UN 2911, UN 2913 and UN 3326, where alternative proper shipping names are separated by the word "or", only the relevant proper shipping name shall be used.

[b] The term "fissile-excepted" refers only to material excepted under para. 417.

404. In the calculations of A_1 and A_2 for a radionuclide not listed in Table 2, a single radioactive decay chain in which the radionuclides are present in their naturally occurring proportions, and in which no daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide, shall be considered as a single radionuclide; and the activity to be taken into account and the A_1 or A_2 value to be applied shall be that corresponding to the parent nuclide of that chain. In the case of radioactive decay chains in which any daughter nuclide has a half-life either longer than 10 days or longer than that of the parent nuclide, the parent and such daughter nuclides shall be considered as mixtures of different nuclides.

405. For mixtures of radionuclides, the basic radionuclide values referred to in para. 402 may be determined as follows:

$$X_{\mathrm{m}} = \frac{1}{\sum_{\mathrm{i}} \frac{f(\mathrm{i})}{X(\mathrm{i})}}$$

where

$f(\mathrm{i})$ is the fraction of activity or activity concentration of radionuclide i in the mixture.

$X(\mathrm{i})$ is the appropriate value of A_1 or A_2, or the activity concentration limit for exempt material or the activity limit for an exempt *consignment* as appropriate for the radionuclide i.

X_{m} is the derived value of A_1 or A_2, or the activity concentration limit for exempt material or the activity limit for an exempt *consignment* in the case of a mixture.

TABLE 2. BASIC RADIONUCLIDE VALUES

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Actinium (89)				
Ac-225 (a)	8×10^{-1}	6×10^{-3}	1×10^{1}	1×10^{4}
Ac-227 (a)	9×10^{-1}	9×10^{-5}	1×10^{-1}	1×10^{3}
Ac-228	6×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Silver (47)				
Ag-105	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Ag-108m (a)	7×10^{-1}	7×10^{-1}	1×10^{1} (b)	1×10^{6} (b)
Ag-110m (a)	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{6}
Ag-111	2×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Aluminium (13)				
Al-26	1×10^{-1}	1×10^{-1}	1×10^{1}	1×10^{5}
Americium (95)				
Am-241	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{4}
Am-242m (a)	1×10^{1}	1×10^{-3}	1×10^{0} (b)	1×10^{4} (b)
Am-243 (a)	5×10^{0}	1×10^{-3}	1×10^{0} (b)	1×10^{3} (b)
Argon (18)				
Ar-37	4×10^{1}	4×10^{1}	1×10^{6}	1×10^{8}
Ar-39	4×10^{1}	2×10^{1}	1×10^{7}	1×10^{4}
Ar-41	3×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{9}
Arsenic (33)				
As-72	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
As-73	4×10^{1}	4×10^{1}	1×10^{3}	1×10^{7}
As-74	1×10^{0}	9×10^{-1}	1×10^{1}	1×10^{6}
As-76	3×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{5}
As-77	2×10^{1}	7×10^{-1}	1×10^{3}	1×10^{6}
Astatine (85)				
At-211 (a)	2×10^{1}	5×10^{-1}	1×10^{3}	1×10^{7}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Gold (79)				
Au-193	7×10^{0}	2×10^{0}	1×10^{2}	1×10^{7}
Au-194	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Au-195	1×10^{1}	6×10^{0}	1×10^{2}	1×10^{7}
Au-198	1×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Au-199	1×10^{1}	6×10^{-1}	1×10^{2}	1×10^{6}
Barium (56)				
Ba-131 (a)	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Ba-133	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Ba-133m	2×10^{1}	6×10^{-1}	1×10^{2}	1×10^{6}
Ba-140 (a)	5×10^{-1}	3×10^{-1}	1×10^{1} (b)	1×10^{5} (b)
Beryllium (4)				
Be-7	2×10^{1}	2×10^{1}	1×10^{3}	1×10^{7}
Be-10	4×10^{1}	6×10^{-1}	1×10^{4}	1×10^{6}
Bismuth (83)				
Bi-205	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Bi-206	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Bi-207	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Bi-210	1×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Bi-210m (a)	6×10^{-1}	2×10^{-2}	1×10^{1}	1×10^{5}
Bi-212 (a)	7×10^{-1}	6×10^{-1}	1×10^{1} (b)	1×10^{5} (b)
Berkelium (97)				
Bk-247	8×10^{0}	8×10^{-4}	1×10^{0}	1×10^{4}
Bk-249 (a)	4×10^{1}	3×10^{-1}	1×10^{3}	1×10^{6}
Bromine (35)				
Br-76	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Br-77	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Br-82	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Carbon (6)				
C-11	1×10^{0}	6×10^{-1}	1×10^{1}	1×10^{6}
C-14	4×10^{1}	3×10^{0}	1×10^{4}	1×10^{7}
Calcium (20)				
Ca-41	Unlimited	Unlimited	1×10^{5}	1×10^{7}
Ca-45	4×10^{1}	1×10^{0}	1×10^{4}	1×10^{7}
Ca-47 (a)	3×10^{0}	3×10^{-1}	1×10^{1}	1×10^{6}
Cadmium (48)				
Cd-109	3×10^{1}	2×10^{0}	1×10^{4}	1×10^{6}
Cd-113m	4×10^{1}	5×10^{-1}	1×10^{3}	1×10^{6}
Cd-115 (a)	3×10^{0}	4×10^{-1}	1×10^{2}	1×10^{6}
Cd-115m	5×10^{-1}	5×10^{-1}	1×10^{3}	1×10^{6}
Cerium (58)				
Ce-139	7×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Ce-141	2×10^{1}	6×10^{-1}	1×10^{2}	1×10^{7}
Ce-143	9×10^{-1}	6×10^{-1}	1×10^{2}	1×10^{6}
Ce-144 (a)	2×10^{-1}	2×10^{-1}	1×10^{2} (b)	1×10^{5} (b)
Californium (98)				
Cf-248	4×10^{1}	6×10^{-3}	1×10^{1}	1×10^{4}
Cf-249	3×10^{0}	8×10^{-4}	1×10^{0}	1×10^{3}
Cf-250	2×10^{1}	2×10^{-3}	1×10^{1}	1×10^{4}
Cf-251	7×10^{0}	7×10^{-4}	1×10^{0}	1×10^{3}
Cf-252	1×10^{-1}	3×10^{-3}	1×10^{1}	1×10^{4}
Cf-253 (a)	4×10^{1}	4×10^{-2}	1×10^{2}	1×10^{5}
Cf-254	1×10^{-3}	1×10^{-3}	1×10^{0}	1×10^{3}
Chlorine (17)				
Cl-36	1×10^{1}	6×10^{-1}	1×10^{4}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Cl-38	2×10^{-1}	2×10^{-1}	1×10^{1}	1×10^{5}
Curium (96)				
Cm-240	4×10^{1}	2×10^{-2}	1×10^{2}	1×10^{5}
Cm-241	2×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
Cm-242	4×10^{1}	1×10^{-2}	1×10^{2}	1×10^{5}
Cm-243	9×10^{0}	1×10^{-3}	1×10^{0}	1×10^{4}
Cm-244	2×10^{1}	2×10^{-3}	1×10^{1}	1×10^{4}
Cm-245	9×10^{0}	9×10^{-4}	1×10^{0}	1×10^{3}
Cm-246	9×10^{0}	9×10^{-4}	1×10^{0}	1×10^{3}
Cm-247 (a)	3×10^{0}	1×10^{-3}	1×10^{0}	1×10^{4}
Cm-248	2×10^{-2}	3×10^{-4}	1×10^{0}	1×10^{3}
Cobalt (27)				
Co-55	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Co-56	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Co-57	1×10^{1}	1×10^{1}	1×10^{2}	1×10^{6}
Co-58	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Co-58m	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{7}
Co-60	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Chromium (24)				
Cr-51	3×10^{1}	3×10^{1}	1×10^{3}	1×10^{7}
Caesium (55)				
Cs-129	4×10^{0}	4×10^{0}	1×10^{2}	1×10^{5}
Cs-131	3×10^{1}	3×10^{1}	1×10^{3}	1×10^{6}
Cs-132	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{5}
Cs-134	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{4}
Cs-134m	4×10^{1}	6×10^{-1}	1×10^{3}	1×10^{5}
Cs-135	4×10^{1}	1×10^{0}	1×10^{4}	1×10^{7}
Cs-136	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{5}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Cs-137 (a)	2×10^{0}	6×10^{-1}	1×10^{1} (b)	1×10^{4} (b)
Copper (29)				
Cu-64	6×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
Cu-67	1×10^{1}	7×10^{-1}	1×10^{2}	1×10^{6}
Dysprosium (66)				
Dy-159	2×10^{1}	2×10^{1}	1×10^{3}	1×10^{7}
Dy-165	9×10^{-1}	6×10^{-1}	1×10^{3}	1×10^{6}
Dy-166 (a)	9×10^{-1}	3×10^{-1}	1×10^{3}	1×10^{6}
Erbium (68)				
Er-169	4×10^{1}	1×10^{0}	1×10^{4}	1×10^{7}
Er-171	8×10^{-1}	5×10^{-1}	1×10^{2}	1×10^{6}
Europium (63)				
Eu-147	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Eu-148	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Eu-149	2×10^{1}	2×10^{1}	1×10^{2}	1×10^{7}
Eu-150 (short lived)	2×10^{0}	7×10^{-1}	1×10^{3}	1×10^{6}
Eu-150 (long lived)	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Eu-152	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Eu-152m	8×10^{-1}	8×10^{-1}	1×10^{2}	1×10^{6}
Eu-154	9×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Eu-155	2×10^{1}	3×10^{0}	1×10^{2}	1×10^{7}
Eu-156	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Fluorine (9)				
F-18	1×10^{0}	6×10^{-1}	1×10^{1}	1×10^{6}
Iron (26)				
Fe-52 (a)	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{6}
Fe-55	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Fe-59	9×10^{-1}	9×10^{-1}	1×10^{1}	1×10^{6}
Fe-60 (a)	4×10^{1}	2×10^{-1}	1×10^{2}	1×10^{5}
Gallium (31)				
Ga-67	7×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Ga-68	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{5}
Ga-72	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Gadolinium (64)				
Gd-146 (a)	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Gd-148	2×10^{1}	2×10^{-3}	1×10^{1}	1×10^{4}
Gd-153	1×10^{1}	9×10^{0}	1×10^{2}	1×10^{7}
Gd-159	3×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Germanium (32)				
Ge-68 (a)	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{5}
Ge-71	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{8}
Ge-77	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Hafnium (72)				
Hf-172 (a)	6×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Hf-175	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Hf-181	2×10^{0}	5×10^{-1}	1×10^{1}	1×10^{6}
Hf-182	Unlimited	Unlimited	1×10^{2}	1×10^{6}
Mercury (80)				
Hg-194 (a)	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Hg-195m (a)	3×10^{0}	7×10^{-1}	1×10^{2}	1×10^{6}
Hg-197	2×10^{1}	1×10^{1}	1×10^{2}	1×10^{7}
Hg-197m	1×10^{1}	4×10^{-1}	1×10^{2}	1×10^{6}
Hg-203	5×10^{0}	1×10^{0}	1×10^{2}	1×10^{5}
Holmium (67)				
Ho-166	4×10^{-1}	4×10^{-1}	1×10^{3}	1×10^{5}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Ho-166m	6×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Iodine (53)				
I-123	6×10^{0}	3×10^{0}	1×10^{2}	1×10^{7}
I-124	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
I-125	2×10^{1}	3×10^{0}	1×10^{3}	1×10^{6}
I-126	2×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
I-129	Unlimited	Unlimited	1×10^{2}	1×10^{5}
I-131	3×10^{0}	7×10^{-1}	1×10^{2}	1×10^{6}
I-132	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
I-133	7×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
I-134	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
I-135 (a)	6×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Indium (49)				
In-111	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
In-113m	4×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
In-114m (a)	1×10^{1}	5×10^{-1}	1×10^{2}	1×10^{6}
In-115m	7×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
Iridium (77)				
Ir-189 (a)	1×10^{1}	1×10^{1}	1×10^{2}	1×10^{7}
Ir-190	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Ir-192	1×10^{0} (c)	6×10^{-1}	1×10^{1}	1×10^{4}
Ir-194	3×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{5}
Potassium (19)				
K-40	9×10^{-1}	9×10^{-1}	1×10^{2}	1×10^{6}
K-42	2×10^{-1}	2×10^{-1}	1×10^{2}	1×10^{6}
K-43	7×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Krypton (36)				
Kr-79	4×10^{0}	2×10^{0}	1×10^{3}	1×10^{5}
Kr-81	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{7}
Kr-85	1×10^{1}	1×10^{1}	1×10^{5}	1×10^{4}
Kr-85m	8×10^{0}	3×10^{0}	1×10^{3}	1×10^{10}
Kr-87	2×10^{-1}	2×10^{-1}	1×10^{2}	1×10^{9}
Lanthanum (57)				
La-137	3×10^{1}	6×10^{0}	1×10^{3}	1×10^{7}
La-140	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Lutetium (71)				
Lu-172	6×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Lu-173	8×10^{0}	8×10^{0}	1×10^{2}	1×10^{7}
Lu-174	9×10^{0}	9×10^{0}	1×10^{2}	1×10^{7}
Lu-174m	2×10^{1}	1×10^{1}	1×10^{2}	1×10^{7}
Lu-177	3×10^{1}	7×10^{-1}	1×10^{3}	1×10^{7}
Magnesium (12)				
Mg-28 (a)	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Manganese (25)				
Mn-52	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Mn-53	Unlimited	Unlimited	1×10^{4}	1×10^{9}
Mn-54	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Mn-56	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Molybdenum (42)				
Mo-93	4×10^{1}	2×10^{1}	1×10^{3}	1×10^{8}
Mo-99 (a)	1×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Nitrogen (7)				
N-13	9×10^{-1}	6×10^{-1}	1×10^{2}	1×10^{9}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Sodium (11)				
Na-22	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Na-24	2×10^{-1}	2×10^{-1}	1×10^{1}	1×10^{5}
Niobium (41)				
Nb-93m	4×10^{1}	3×10^{1}	1×10^{4}	1×10^{7}
Nb-94	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Nb-95	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Nb-97	9×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Neodymium (60)				
Nd-147	6×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Nd-149	6×10^{-1}	5×10^{-1}	1×10^{2}	1×10^{6}
Nickel (28)				
Ni-59	Unlimited	Unlimited	1×10^{4}	1×10^{8}
Ni-63	4×10^{1}	3×10^{1}	1×10^{5}	1×10^{8}
Ni-65	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{6}
Neptunium (93)				
Np-235	4×10^{1}	4×10^{1}	1×10^{3}	1×10^{7}
Np-236 (short lived)	2×10^{1}	2×10^{0}	1×10^{3}	1×10^{7}
Np-236 (long lived)	9×10^{0}	2×10^{-2}	1×10^{2}	1×10^{5}
Np-237	2×10^{1}	2×10^{-3}	1×10^{0} (b)	1×10^{3} (b)
Np-239	7×10^{0}	4×10^{-1}	1×10^{2}	1×10^{7}
Osmium (76)				
Os-185	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Os-191	1×10^{1}	2×10^{0}	1×10^{2}	1×10^{7}
Os-191m	4×10^{1}	3×10^{1}	1×10^{3}	1×10^{7}
Os-193	2×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Os-194 (a)	3×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{5}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Phosphorus (15)				
P-32	5×10^{-1}	5×10^{-1}	1×10^{3}	1×10^{5}
P-33	4×10^{1}	1×10^{0}	1×10^{5}	1×10^{8}
Protactinium (91)				
Pa-230 (a)	2×10^{0}	7×10^{-2}	1×10^{1}	1×10^{6}
Pa-231	4×10^{0}	4×10^{-4}	1×10^{0}	1×10^{3}
Pa-233	5×10^{0}	7×10^{-1}	1×10^{2}	1×10^{7}
Lead (82)				
Pb-201	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Pb-202	4×10^{1}	2×10^{1}	1×10^{3}	1×10^{6}
Pb-203	4×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Pb-205	Unlimited	Unlimited	1×10^{4}	1×10^{7}
Pb-210 (a)	1×10^{0}	5×10^{-2}	1×10^{1} (b)	1×10^{4} (b)
Pb-212 (a)	7×10^{-1}	2×10^{-1}	1×10^{1} (b)	1×10^{5} (b)
Palladium (46)				
Pd-103 (a)	4×10^{1}	4×10^{1}	1×10^{3}	1×10^{8}
Pd-107	Unlimited	Unlimited	1×10^{5}	1×10^{8}
Pd-109	2×10^{0}	5×10^{-1}	1×10^{3}	1×10^{6}
Promethium (61)				
Pm-143	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Pm-144	7×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Pm-145	3×10^{1}	1×10^{1}	1×10^{3}	1×10^{7}
Pm-147	4×10^{1}	2×10^{0}	1×10^{4}	1×10^{7}
Pm-148m (a)	8×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Pm-149	2×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Pm-151	2×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Polonium (84)				
Po-210	4×10^{1}	2×10^{-2}	1×10^{1}	1×10^{4}
Praseodymium (59)				
Pr-142	4×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{5}
Pr-143	3×10^{0}	6×10^{-1}	1×10^{4}	1×10^{6}
Platinum (78)				
Pt-188 (a)	1×10^{0}	8×10^{-1}	1×10^{1}	1×10^{6}
Pt-191	4×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Pt-193	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{7}
Pt-193m	4×10^{1}	5×10^{-1}	1×10^{3}	1×10^{7}
Pt-195m	1×10^{1}	5×10^{-1}	1×10^{2}	1×10^{6}
Pt-197	2×10^{1}	6×10^{-1}	1×10^{3}	1×10^{6}
Pt-197m	1×10^{1}	6×10^{-1}	1×10^{2}	1×10^{6}
Plutonium (94)				
Pu-236	3×10^{1}	3×10^{-3}	1×10^{1}	1×10^{4}
Pu-237	2×10^{1}	2×10^{1}	1×10^{3}	1×10^{7}
Pu-238	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{4}
Pu-239	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{4}
Pu-240	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{3}
Pu-241 (a)	4×10^{1}	6×10^{-2}	1×10^{2}	1×10^{5}
Pu-242	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{4}
Pu-244 (a)	4×10^{-1}	1×10^{-3}	1×10^{0}	1×10^{4}
Radium (88)				
Ra-223 (a)	4×10^{-1}	7×10^{-3}	1×10^{2} (b)	1×10^{5} (b)
Ra-224 (a)	4×10^{-1}	2×10^{-2}	1×10^{1} (b)	1×10^{5} (b)
Ra-225 (a)	2×10^{-1}	4×10^{-3}	1×10^{2}	1×10^{5}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Ra-226 (a)	2×10^{-1}	3×10^{-3}	1×10^{1} (b)	1×10^{4} (b)
Ra-228 (a)	6×10^{-1}	2×10^{-2}	1×10^{1} (b)	1×10^{5} (b)
Rubidium (37)				
Rb-81	2×10^{0}	8×10^{-1}	1×10^{1}	1×10^{6}
Rb-83 (a)	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Rb-84	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Rb-86	5×10^{-1}	5×10^{-1}	1×10^{2}	1×10^{5}
Rb-87	Unlimited	Unlimited	1×10^{4}	1×10^{7}
Rb (natural)	Unlimited	Unlimited	1×10^{4}	1×10^{7}
Rhenium (75)				
Re-184	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Re-184m	3×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
Re-186	2×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Re-187	Unlimited	Unlimited	1×10^{6}	1×10^{9}
Re-188	4×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{5}
Re-189 (a)	3×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Re (natural)	Unlimited	Unlimited	1×10^{6}	1×10^{9}
Rhodium (45)				
Rh-99	2×10^{0}	2×10^{0}	1×10^{1}	1×10^{6}
Rh-101	4×10^{0}	3×10^{0}	1×10^{2}	1×10^{7}
Rh-102	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Rh-102m	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Rh-103m	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{8}
Rh-105	1×10^{1}	8×10^{-1}	1×10^{2}	1×10^{7}
Radon (86)				
Rn-222 (a)	3×10^{-1}	4×10^{-3}	1×10^{1} (b)	1×10^{8} (b)

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Ruthenium (44)				
Ru-97	5×10^{0}	5×10^{0}	1×10^{2}	1×10^{7}
Ru-103 (a)	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Ru-105	1×10^{0}	6×10^{-1}	1×10^{1}	1×10^{6}
Ru-106 (a)	2×10^{-1}	2×10^{-1}	1×10^{2} (b)	1×10^{5} (b)
Sulphur (16)				
S-35	4×10^{1}	3×10^{0}	1×10^{5}	1×10^{8}
Antimony (51)				
Sb-122	4×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{4}
Sb-124	6×10^{-1}	6×10^{-1}	1×10^{1}	1×10^{6}
Sb-125	2×10^{0}	1×10^{0}	1×10^{2}	1×10^{6}
Sb-126	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Scandium (21)				
Sc-44	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{5}
Sc-46	5×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Sc-47	1×10^{1}	7×10^{-1}	1×10^{2}	1×10^{6}
Sc-48	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Selenium (34)				
Se-75	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Se-79	4×10^{1}	2×10^{0}	1×10^{4}	1×10^{7}
Silicon (14)				
Si-31	6×10^{-1}	6×10^{-1}	1×10^{3}	1×10^{6}
Si-32	4×10^{1}	5×10^{-1}	1×10^{3}	1×10^{6}
Samarium (62)				
Sm-145	1×10^{1}	1×10^{1}	1×10^{2}	1×10^{7}
Sm-147	Unlimited	Unlimited	1×10^{1}	1×10^{4}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Sm-151	4×10^{1}	1×10^{1}	1×10^{4}	1×10^{8}
Sm-153	9×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
Tin (50)				
Sn-113 (a)	4×10^{0}	2×10^{0}	1×10^{3}	1×10^{7}
Sn-117m	7×10^{0}	4×10^{-1}	1×10^{2}	1×10^{6}
Sn-119m	4×10^{1}	3×10^{1}	1×10^{3}	1×10^{7}
Sn-121m (a)	4×10^{1}	9×10^{-1}	1×10^{3}	1×10^{7}
Sn-123	8×10^{-1}	6×10^{-1}	1×10^{3}	1×10^{6}
Sn-125	4×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{5}
Sn-126 (a)	6×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Strontium (38)				
Sr-82 (a)	2×10^{-1}	2×10^{-1}	1×10^{1}	1×10^{5}
Sr-85	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Sr-85m	5×10^{0}	5×10^{0}	1×10^{2}	1×10^{7}
Sr-87m	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Sr-89	6×10^{-1}	6×10^{-1}	1×10^{3}	1×10^{6}
Sr-90 (a)	3×10^{-1}	3×10^{-1}	1×10^{2} (b)	1×10^{4} (b)
Sr-91 (a)	3×10^{-1}	3×10^{-1}	1×10^{1}	1×10^{5}
Sr-92 (a)	1×10^{0}	3×10^{-1}	1×10^{1}	1×10^{6}
Tritium (1)				
T(H-3)	4×10^{1}	4×10^{1}	1×10^{6}	1×10^{9}
Tantalum (73)				
Ta-178 (long lived)	1×10^{0}	8×10^{-1}	1×10^{1}	1×10^{6}
Ta-179	3×10^{1}	3×10^{1}	1×10^{3}	1×10^{7}
Ta-182	9×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{4}
Terbium (65)				
Tb-157	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{7}
Tb-158	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Tb-160	1×10^{0}	6×10^{-1}	1×10^{1}	1×10^{6}
Technetium (43)				
Tc-95m (a)	2×10^{0}	2×10^{0}	1×10^{1}	1×10^{6}
Tc-96	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{6}
Tc-96m (a)	4×10^{-1}	4×10^{-1}	1×10^{3}	1×10^{7}
Tc-97	Unlimited	Unlimited	1×10^{3}	1×10^{8}
Tc-97m	4×10^{1}	1×10^{0}	1×10^{3}	1×10^{7}
Tc-98	8×10^{-1}	7×10^{-1}	1×10^{1}	1×10^{6}
Tc-99	4×10^{1}	9×10^{-1}	1×10^{4}	1×10^{7}
Tc-99m	1×10^{1}	4×10^{0}	1×10^{2}	1×10^{7}
Tellurium (52)				
Te-121	2×10^{0}	2×10^{0}	1×10^{1}	1×10^{6}
Te-121m	5×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Te-123m	8×10^{0}	1×10^{0}	1×10^{2}	1×10^{7}
Te-125m	2×10^{1}	9×10^{-1}	1×10^{3}	1×10^{7}
Te-127	2×10^{1}	7×10^{-1}	1×10^{3}	1×10^{6}
Te-127m (a)	2×10^{1}	5×10^{-1}	1×10^{3}	1×10^{7}
Te-129	7×10^{-1}	6×10^{-1}	1×10^{2}	1×10^{6}
Te-129m (a)	8×10^{-1}	4×10^{-1}	1×10^{3}	1×10^{6}
Te-131m (a)	7×10^{-1}	5×10^{-1}	1×10^{1}	1×10^{6}
Te-132 (a)	5×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{7}
Thorium (90)				
Th-227	1×10^{1}	5×10^{-3}	1×10^{1}	1×10^{4}
Th-228 (a)	5×10^{-1}	1×10^{-3}	1×10^{0} (b)	1×10^{4} (b)
Th-229	5×10^{0}	5×10^{-4}	1×10^{0} (b)	1×10^{3} (b)
Th-230	1×10^{1}	1×10^{-3}	1×10^{0}	1×10^{4}
Th-231	4×10^{1}	2×10^{-2}	1×10^{3}	1×10^{7}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Th-232	Unlimited	Unlimited	1×10^{1}	1×10^{4}
Th-234 (a)	3×10^{-1}	3×10^{-1}	1×10^{3} (b)	1×10^{5} (b)
Th (natural)	Unlimited	Unlimited	1×10^{0} (b)	1×10^{3} (b)
Titanium (22)				
Ti-44 (a)	5×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
Thallium (81)				
Tl-200	9×10^{-1}	9×10^{-1}	1×10^{1}	1×10^{6}
Tl-201	1×10^{1}	4×10^{0}	1×10^{2}	1×10^{6}
Tl-202	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Tl-204	1×10^{1}	7×10^{-1}	1×10^{4}	1×10^{4}
Thulium (69)				
Tm-167	7×10^{0}	8×10^{-1}	1×10^{2}	1×10^{6}
Tm-170	3×10^{0}	6×10^{-1}	1×10^{3}	1×10^{6}
Tm-171	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{8}
Uranium (92)				
U-230 (fast lung absorption) (a)(d)	4×10^{1}	1×10^{-1}	1×10^{1} (b)	1×10^{5} (b)
U-230 (medium lung absorption) (a)(e)	4×10^{1}	4×10^{-3}	1×10^{1}	1×10^{4}
U-230 (slow lung absorption) (a)(f)	3×10^{1}	3×10^{-3}	1×10^{1}	1×10^{4}
U-232 (fast lung absorption) (d)	4×10^{1}	1×10^{-2}	1×10^{0} (b)	1×10^{3} (b)
U-232 (medium lung absorption) (e)	4×10^{1}	7×10^{-3}	1×10^{1}	1×10^{4}
U-232 (slow lung absorption) (f)	1×10^{1}	1×10^{-3}	1×10^{1}	1×10^{4}
U-233 (fast lung absorption) (d)	4×10^{1}	9×10^{-2}	1×10^{1}	1×10^{4}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
U-233 (medium lung absorption) (e)	4×10^{1}	2×10^{-2}	1×10^{2}	1×10^{5}
U-233 (slow lung absorption) (f)	4×10^{1}	6×10^{-3}	1×10^{1}	1×10^{5}
U-234 (fast lung absorption) (d)	4×10^{1}	9×10^{-2}	1×10^{1}	1×10^{4}
U-234 (medium lung absorption) (e)	4×10^{1}	2×10^{-2}	1×10^{2}	1×10^{5}
U-234 (slow lung absorption) (f)	4×10^{1}	6×10^{-3}	1×10^{1}	1×10^{5}
U-235 (all lung absorption types) (a)(d)(e)(f)	Unlimited	Unlimited	1×10^{1} (b)	1×10^{4} (b)
U-236 (fast lung absorption) (d)	Unlimited	Unlimited	1×10^{1}	1×10^{4}
U-236 (medium lung absorption) (e)	4×10^{1}	2×10^{-2}	1×10^{2}	1×10^{5}
U-236 (slow lung absorption) (f)	4×10^{1}	6×10^{-3}	1×10^{1}	1×10^{4}
U-238 (all lung absorption types) (d)(e)(f)	Unlimited	Unlimited	1×10^{1} (b)	1×10^{4} (b)
U (natural)	Unlimited	Unlimited	1×10^{0} (b)	1×10^{3} (b)
U (enriched to 20% or less) (g)	Unlimited	Unlimited	1×10^{0}	1×10^{3}
U (depleted)	Unlimited	Unlimited	1×10^{0}	1×10^{3}
Vanadium (23)				
V-48	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{5}
V-49	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{7}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Tungsten (74)				
W-178 (a)	9×10^{0}	5×10^{0}	1×10^{1}	1×10^{6}
W-181	3×10^{1}	3×10^{1}	1×10^{3}	1×10^{7}
W-185	4×10^{1}	8×10^{-1}	1×10^{4}	1×10^{7}
W-187	2×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}
W-188 (a)	4×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{5}
Xenon (54)				
Xe-122 (a)	4×10^{-1}	4×10^{-1}	1×10^{2}	1×10^{9}
Xe-123	2×10^{0}	7×10^{-1}	1×10^{2}	1×10^{9}
Xe-127	4×10^{0}	2×10^{0}	1×10^{3}	1×10^{5}
Xe-131m	4×10^{1}	4×10^{1}	1×10^{4}	1×10^{4}
Xe-133	2×10^{1}	1×10^{1}	1×10^{3}	1×10^{4}
Xe-135	3×10^{0}	2×10^{0}	1×10^{3}	1×10^{10}
Yttrium (39)				
Y-87 (a)	1×10^{0}	1×10^{0}	1×10^{1}	1×10^{6}
Y-88	4×10^{-1}	4×10^{-1}	1×10^{1}	1×10^{6}
Y-90	3×10^{-1}	3×10^{-1}	1×10^{3}	1×10^{5}
Y-91	6×10^{-1}	6×10^{-1}	1×10^{3}	1×10^{6}
Y-91m	2×10^{0}	2×10^{0}	1×10^{2}	1×10^{6}
Y-92	2×10^{-1}	2×10^{-1}	1×10^{2}	1×10^{5}
Y-93	3×10^{-1}	3×10^{-1}	1×10^{2}	1×10^{5}
Ytterbium (70)				
Yb-169	4×10^{0}	1×10^{0}	1×10^{2}	1×10^{7}
Yb-175	3×10^{1}	9×10^{-1}	1×10^{3}	1×10^{7}
Zinc (30)				
Zn-65	2×10^{0}	2×10^{0}	1×10^{1}	1×10^{6}
Zn-69	3×10^{0}	6×10^{-1}	1×10^{4}	1×10^{6}
Zn-69m (a)	3×10^{0}	6×10^{-1}	1×10^{2}	1×10^{6}

TABLE 2. BASIC RADIONUCLIDE VALUES (cont.)

Radionuclide (atomic number)	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Zirconium (40)				
Zr-88	3×10^{0}	3×10^{0}	1×10^{2}	1×10^{6}
Zr-93	Unlimited	Unlimited	1×10^{3} (b)	1×10^{7} (b)
Zr-95 (a)	2×10^{0}	8×10^{-1}	1×10^{1}	1×10^{6}
Zr-97 (a)	4×10^{-1}	4×10^{-1}	1×10^{1} (b)	1×10^{5} (b)

(a) A_1 and/or A_2 values for these parent radionuclides include contributions from their progeny with half-lives less than 10 days, as listed in the following:

Mg-28	Al-28
Ar-42	K-42
Ca-47	Sc-47
Ti-44	Sc-44
Fe-52	Mn-52m
Fe-60	Co-60m
Zn-69m	Zn-69
Ge-68	Ga-68
Rb-83	Kr-83m
Sr-82	Rb-82
Sr-90	Y-90
Sr-91	Y-91m
Sr-92	Y-92
Y-87	Sr-87m
Zr-95	Nb-95m
Zr-97	Nb-97m, Nb-97
Mo-99	Tc-99m
Tc-95m	Tc-95
Tc-96m	Tc-96
Ru-103	Rh-103m
Ru-106	Rh-106
Pd-103	Rh-103m
Ag-108m	Ag-108
Ag-110m	Ag-110
Cd-115	In-115m
In-114m	In-114

Table 2, footnote (a) (cont.)

Sn-113	In-113m
Sn-121m	Sn-121
Sn-126	Sb-126m
Te-118	Sb-118
Te-127m	Te-127
Te-129m	Te-129
Te-131m	Te-131
Te-132	I-132
I-135	Xe-135m
Xe-122	I-122
Cs-137	Ba-137m
Ba-131	Cs-131
Ba-140	La-140
Ce-144	Pr-144m, Pr-144
Pm-148m	Pm-148
Gd-146	Eu-146
Dy-166	Ho-166
Hf-172	Lu-172
W-178	Ta-178
W-188	Re-188
Re-189	Os-189m
Os-194	Ir-194
Ir-189	Os-189m
Pt-188	Ir-188
Hg-194	Au-194
Hg-195m	Hg-195
Pb-210	Bi-210
Pb-212	Bi-212, Tl-208, Po-212
Bi-210m	Tl-206
Bi-212	Tl-208, Po-212
At-211	Po-211
Rn-222	Po-218, Pb-214, At-218, Bi-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Po-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Ra-225	Ac-225, Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ra-226	Rn-222, Po-218, Pb-214, At-218, Bi-214, Po-214
Ra-228	Ac-228
Ac-225	Fr-221, At-217, Bi-213, Tl-209, Po-213, Pb-209
Ac-227	Fr-223
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208, Po-212
Th-234	Pa-234m, Pa-234
Pa-230	Ac-226, Th-226, Fr-222, Ra-222, Rn-218, Po-214
U-230	Th-226, Ra-222, Rn-218, Po-214
U-235	Th-231

Table 2, footnote (a) (cont.)

Pu-241	U-237
Pu-244	U-240, Np-240m
Am-242m	Am-242, Np-238
Am-243	Np-239
Cm-247	Pu-243
Bk-249	Am-245
Cf-253	Cm-249

(b) Parent nuclides and their progeny included in secular equilibrium are listed in the following:

Sr-90	Y-90
Zr-93	Nb-93m
Zr-97	Nb-97
Ru-106	Rh-106
Ag-108m	Ag-108
Cs-137	Ba-137m
Ce-144	Pr-144
Ba-140	La-140
Bi-212	Tl-208 (0.36), Po-212 (0.64)
Pb-210	Bi-210, Po-210
Pb-212	Bi-212, Tl-208 (0.36), Po-212 (0.64)
Rn-222	Po-218, Pb-214, Bi-214, Po-214
Ra-223	Rn-219, Po-215, Pb-211, Bi-211, Tl-207
Ra-224	Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Ra-226	Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
Ra-228	Ac-228
Th-228	Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-229	Ra-225, Ac-225, Fr-221, At-217, Bi-213, Po-213, Pb-209
Th-natural	Ra-228, Ac-228, Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
Th-234	Pa-234m
U-230	Th-226, Ra-222, Rn-218, Po-214
U-232	Th-228, Ra-224, Rn-220, Po-216, Pb-212, Bi-212, Tl-208 (0.36), Po-212 (0.64)
U-235	Th-231
U-238	Th-234, Pa-234m
U-natural	Th-234, Pa-234m, U-234, Th-230, Ra-226, Rn-222, Po-218, Pb-214, Bi-214, Po-214, Pb-210, Bi-210, Po-210
Np-237	Pa-233
Am-242m	Am-242
Am-243	Np-239

(c) The quantity may be determined from a measurement of the rate of decay or a measurement of the *radiation level* at a prescribed distance from the source.

(d) These values apply only to compounds of *uranium* that take the chemical form of UF_6, UO_2F_2 and $UO_2(NO_3)_2$ in both normal and accident conditions of transport.

(e) These values apply only to compounds of *uranium* that take the chemical form of UO_3, UF_4, UCl_4 and hexavalent compounds in both normal and accident conditions of transport.

(f) These values apply to all compounds of *uranium* other than those specified in (d) and (e) above.

(g) These values apply to *unirradiated uranium* only.

406. When the identity of each radionuclide is known but the individual activities of some of the radionuclides are not known, the radionuclides may be grouped and the lowest radionuclide value, as appropriate for the radionuclides in each group, may be used in applying the formulas in paras 405 and 430. Groups may be based on the total alpha activity and the total beta/gamma activity when these are known, using the lowest radionuclide values for the alpha emitters or beta/gamma emitters, respectively.

407. For individual radionuclides or for mixtures of radionuclides for which relevant data are not available, the values shown in Table 3 shall be used.

TABLE 3. BASIC RADIONUCLIDE VALUES FOR UNKNOWN RADIONUCLIDES OR MIXTURES

Radioactive content	A_1	A_2	Activity concentration limit for exempt material	Activity limit for an exempt *consignment*
	(TBq)	(TBq)	(Bq/g)	(Bq)
Only beta or gamma emitting nuclides are known to be present	0.1	0.02	1×10^{1}	1×10^{4}
Alpha emitting nuclides, but no neutron emitters are known to be present	0.2	9×10^{-5}	1×10^{-1}	1×10^{3}
Neutron emitting nuclides are known to be present or no relevant data are available	0.001	9×10^{-5}	1×10^{-1}	1×10^{3}

APPENDIX

PART III

Section IV

Fissile material[3]

417. *Fissile material* and *packages containing fissile material* shall be classified under the relevant entry as "FISSILE", in accordance with Table 1 unless excepted by one of the provisions of subparagraphs (a)-(f) of this paragraph and transported subject to the requirements of para. 570. All provisions apply only to material in *packages* that meets the requirements of para. 636 unless unpackaged material is specifically allowed in the provision:

(a) Uranium enriched in uranium-235 to a maximum of 1% by mass, and with a total plutonium and uranium-233 content not exceeding 1% of the mass of uranium-235, provided that the fissile nuclides are distributed essentially homogeneously throughout the material. In addition, if uranium-235 is present in metallic, oxide or carbide forms, it shall not form a lattice arrangement.

(b) 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.

(c) Uranium with a maximum uranium enrichment of 5% by mass of uranium-235 provided:

(i) There is no more than 3.5 g uranium-235 per *package*.

(ii) The total plutonium and uranium-233 content does not exceed 1% of the mass of uranium-235 per *package*.

(iii) Transport of the *package* is subject to the *consignment* limit provided in para. 570(c).

(d) Fissile nuclides with a total mass not greater than 2.0 g per package provided the package is transported subject to the consignment limit provided in para. 570(d).

(e) Fissile nuclides with a total mass not greater than 45 g, either packaged or unpackaged, subject to the limits provided in para. 570(e).

(f) A fissile material that meets the requirements of paras 570(b), 606 and 802.

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[3] References in this Appendix Part III to paragraph 570 are references to paragraph 570 of Section V of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.
Reference in this Appendix Part III to paragraph 606 is a reference to paragraph 606 of Section VI of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency. Reference in this Appendix Part III to paragraph 636 is a reference to paragraph 636 of Section VI of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency. Reference in this Appendix Part III to paragraph 802 is a reference to paragraph 802 of Section VIII of the Regulations for the Safe Transport of Radioactive Material, 2012 Edition, of the International Atomic Energy Agency.

Annex II

APPENDIX TO THE DECISION AND RECOMMENDATION OF THE STEERING COMMITTEE CONCERNING THE APPLICATION OF THE PARIS CONVENTION TO NUCLEAR INSTALLATIONS IN THE PROCESS OF BEING DECOMMISSIONED

Definitions

1. For the purpose of this decision and recommendation, "decommissioning" means all steps leading to the release of a nuclear installation from regulatory control. These steps include the processes of decontamination and dismantling.

General provisions

2. In order for a nuclear installation in the process of being decommissioned to be excluded from the application of the Paris Convention:

   a) The operations of the installation in the process of being decommissioned must have permanently ceased, and any nuclear fuel, radioactive material in process, radioactive waste (whether produced during operation or being stored), and radionuclide inventory must have been removed or decayed to the extent that the exclusion criteria and requirements specified in paragraph 3 hereunder are satisfied.

   b) The installation must remain under the control and subject to the regulations of the competent national authority.

   c) Provisions for containment and control of the remaining radioactivity must be in place, as considered appropriate for their purpose by the competent national authority.

Exclusion criteria

3. In order for a nuclear installation in the process of being decommissioned to be excluded from the application of the Paris Convention it must i) meet the installation radioactivity exclusion criteria in paragraph a) below, based on a generic accident assessment; and then, if criteria a) are met, ii) comply with the competent national authority's requests to submit, for review and appraisal, a comprehensive, installation-specific safety assessment to confirm that the dose criteria described in paragraph b) below are met.

   a) Radioactivity criteria

   The generic criteria for allowable activity remaining in an installation in the process of being decommissioned listed below shall be used to decide whether such an installation is eligible for exclusion from the application of the Paris Convention. The radionuclide-specific activity criteria are based on a conservatively biased, generic accident assessment such that off-site exposure to a representative person assumed to be a member of the public would be no greater than 10 mSv in a year. The generic installation activity limits for nuclear installations in the process of being decommissioned are set out in the following table:

Installation Activity Exclusion Criteria by Isotope

Isotope	Fixed activity (Bq)	All other forms of activity (Bq)
Pu^{239}	1 E+13	1 E+12
Pu^{241}	1 E+15	1 E+14
U^{238}	1 E+14	1 E+13
Cs^{137}	1 E+13	1 E+12
Ni^{63}	1 E+16	1 E+15
Co^{60}	1 E+14	1 E+13
Fe^{55}	1 E+16	1 E+15
Eu^{152}	1 E+14	1 E+13
Eu^{154}	1 E+14	1 E+13
Cl^{36}	1 E+12[1]	
Sr^{90}	1 E+14	1 E+13
Ag^{108m}	1 E+13	1 E+12

[1] In a nuclear installation being decommissioned, Cl^{36} is assumed to exist in an easily releasable form. It is also assumed to be fully releasable during accident circumstances, for example fires.

Isotope mixtures:

In the case of a nuclear installation containing several (n) of the isotopes listed above, in the form of fixed activity (f) or any other form of activity (of), it will be necessary to ensure that the activities of the different isotopes present in the installation (A_i) collectively observe the following criterion:

$$\sum_{i=1\ to\ n}\left(\frac{A_{i\ of}}{A_{i\ of\ \lim}}+\frac{A_{i\ f}}{A_{i\ f\ \lim}}\right)\leq 1$$

where $A_{i\ of\ lim}$ is the limit activity for isotope i present in any other form than fixed activity, and

where $A_{i\ f\ lim}$ is the limit activity for isotope i present in the form of fixed activity.

b) Dose criteria

If an installation has met the generic activity criteria specified in a) above, then it can undergo a comprehensive, installation-specific assessment of potential accident scenarios.

Nuclear installations in the process of being decommissioned for which the comprehensive, installation-specific safety assessment suggests that radiological off-site exposures, in terms of the assessed annual effective dose to a representative person under all reasonably conceivable operational conditions, including accidental occurrences and security events, and assuming that protective actions have not been taken, do not result in an assessed annual effective dose to the representative person assumed to be a member of the public of greater than 1 mSv, may be excluded.

Other exclusion considerations

4. It is recognised that radiation dose may, on its own, be an insufficient basis on which to decide to exclude a nuclear installation; therefore, Contracting Parties should consider whether any additional aspect relating to the magnitude and severity of potential nuclear damage requires evaluation in the assessment and decision process by the competent national authority.

Other regulatory and safety assessment aspects

5. Contracting Parties to the Paris Convention (CPPCs) shall ensure that decisions regarding exclusion from the application of the Paris Convention are taken within their national regulatory framework.

6. CPPCs shall require an appropriate safety assessment, including a regulatory review/assessment and prior approval process by the competent national authority to give reasonable assurance that the exclusion provisions and requirements are met in practice. The safety assessment shall consider relevant principles, requirements and guidance as set out in international legal instruments (e.g. conventions), IAEA Safety Standards and related documents. The safety assessment framework requires the description and specification, among other things, of: the scenarios to be considered which could lead to the potential release of radionuclides under accidental conditions; the environmental conditions to be assumed; the transfer of potentially released radionuclides in the environment; the exposure pathways to be evaluated; the dosimetry to be applied in evaluating

radiation doses; and the assumptions to be made regarding the location and habits of the representative person. The results of the analysis shall be compared for compliance with the proposed exclusion criteria.

Annex III

APPENDIX TO THE DECISION AND RECOMMENDATION CONCERNING THE APPLICATION OF THE PARIS CONVENTION ON THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY TO NUCLEAR INSTALLATIONS FOR THE DISPOSAL OF CERTAIN TYPES OF LOW-LEVEL RADIOACTIVE WASTE

Definition

1. "Radioactive waste" means waste within the definition in Article 1(a)(iv) of the Paris Convention.

General provisions

2. In order for a nuclear installation for the disposal of solid radioactive waste to be excluded from the application of the Paris Convention, it must:

(a) meet the exclusion criteria set out in paragraph 3; and

(b) remain, if applicable, under the control of and subject to the relevant national regulations during the operational and post-closure period of the installation as determined by the competent national authority.

Exclusion criteria

3. In order for a nuclear installation for the disposal of solid radioactive waste to be excluded from the application of the Paris Convention it must: i) meet the radioactivity concentration limits in paragraph a) below; and if these limits are met, ii) submit to the competent national authority, for review and appraisal, a comprehensive installation-specific safety assessment to confirm that the dose and criticality criteria described in paragraph b) below are met.

(a) Radioactivity concentration limits

A nuclear installation for the disposal of certain types of solid low-level radioactive waste may be excluded from the application of the Paris Convention if the average radioactivity concentration[1] of the radioactive waste disposed of/to be disposed of at the installation does not/will not exceed the generic activity concentration limits as set out below[2]:

---

[1] Averaged over the activity concentration over a maximum of 10 tonnes of packaged or unpackaged waste or over the mass of each large item of waste (e.g. steam generator, pressuriser or large vessel) greater than 10 tonnes.

[2] The radionuclide activity concentration limits are designed to limit public exposures to less than 10 mSv in a year, and assume that no protective or remedial actions have been taken. In setting the limits a reference basis including a disposal volume of 90 000 m^3 was used.

Radionuclide	Activity Concentration (Bq/g)
H-3	10 000
C-14	10 000
Co-60	200
Sr-90	200
Tc-99	200
Cs-137	200
U-238	200
Pu-239	100
Am-241	100

Isotope mixtures:

For nuclear installations for the disposal of radioactive waste containing more than one radionuclide (n) the activity concentration of the different radionuclides (A_i) in paragraph 3(a) must meet the following criterion:

$$\sum_{i=1 \text{ to } n} \frac{A_i}{A_{i\ \text{lim}}} \leq 1$$

where $A_{i\ \text{lim}}$ is the activity concentration limit for radionuclide i.

(b) Dose and criticality criteria

If an installation meets the generic radioactivity concentration limits specified in paragraph 3(a), then it can undergo a comprehensive installation-specific safety assessment.

The installation may not be excluded unless the assessed annual effective dose off-site to a representative person, assumed to be a member of the public, under all reasonably foreseeable conditions during the period of regulatory control (including the operational period and a period post-closure), including accidental occurrences to the extent as stipulated in relevant national regulations and internationally recognised guidance, and assuming that protective or mitigating actions have not been taken, is less than or equal to 1 mSv per year[3].

The installation-specific safety assessment must demonstrate that the criticality risk is negligible.

The installation-specific safety assessment must take into account the effective dose that

[3] The radiation dose to the public resulting from security events should be assumed to be limited in accordance with national regulations and internationally recognised guidance. In addition, the radiation dose to the public after regulatory control has been released, including from inadvertent human intrusion or low probability events, should be assumed to be limited in accordance with national regulations and internationally recognised guidance.

may result from any non-nuclear waste that may be disposed of at the installation.

Other exclusion considerations

4. It is recognised that radiation dose may, on its own, be an insufficient basis on which to decide to exclude a nuclear installation; therefore, Contracting Parties may consider whether any additional aspects relating to the magnitude and severity of potential nuclear damage requires evaluation in the assessment and decision process by the competent national authority.

Other regulatory and safety assessment aspects

5. Contracting Parties must ensure that decisions regarding exclusion from the application of the Paris Convention are taken within their relevant national regulatory framework.

6. Contracting Parties must require an appropriate safety assessment, including a regulatory review/assessment and prior approval process by the competent national authority, to give reasonable assurance that the exclusion provisions and requirements are met in practice. The safety assessment must consider relevant principles, requirements and guidance as set out in international legal instruments (e.g. conventions), Safety Standards of the International Atomic Energy Agency (IAEA), and related documents. The safety assessment framework requires the description and specification, among other things, of: the scenarios to be considered which could lead to the potential release of radionuclides under accidental conditions; the environmental conditions to be assumed; the transfer of potentially released radionuclides in the environment; the exposure pathways to be evaluated; the dosimetry to be applied in evaluating radiation doses; and the assumptions to be made regarding the location and habits of the representative person. The installation-specific dose assessment carried out under paragraph 3(b) must take account, as appropriate, of the full list of radionuclides in the waste disposed of. The results of the analysis must be compared for compliance with the proposed exclusion criteria.

7. Contracting Parties must maintain (and if necessary establish) a compliance assessment process in order to ensure and demonstrate that the radioactive waste accepted by, and disposed of at, an excluded installation meets the exclusion criteria.

8. Contracting Parties must require that the competent national authority is informed if the operations at an excluded installation change to such extent that the exclusion criteria are no longer met.

9. Contracting Parties which use the option to exclude nuclear installations for the disposal of radioactive waste from the Paris Convention notify the other Contracting Parties, as well as the Secretariat of the OECD Nuclear Energy Agency. Periodically and as appropriate, the Secretariat should analyse the experience gained by the Contracting Parties which use the option to exclude installations from the Paris Convention, and report this back to all Contracting Parties.

Annex IV

ANNEX TO THE RECOMMENDATION OF THE STEERING COMMITTEE ON THE OPERATOR'S CERTIFICATE OF FINANCIAL SECURITY

CERTIFICATE OF FINANCIAL SECURITY FOR THE CARRIAGE OF NUCLEAR SUBSTANCES

Model Certificate recommended by the Steering Committee for Nuclear Energy

CERTIFICAT DE GARANTIE FINANCIÈRE POUR LE TRANSPORT DE SUBSTANCES NUCLÉAIRES
CERTIFICATE OF FINANCIAL SECURITY FOR THE CARRIAGE OF NUCLEAR SUBSTANCES

établi conformément à l'article 4(d)de la Convention de Paris sur la responsabilité dans le domaine de l'énergie nucléaire, en date du 29 juillet 1960 telle qu'amendée par le Protocole additionnel du 28 janvier 1964, par le Protocole du 16 novembre 1982 et par le Protocole du 12 février 2004 ainsi qu'à la loi ……..…
…….....

issued in accordance with article 4(d)*of the Paris Convention on the Third Party Liability in the Field of Nuclear Energy of 29th July 1960 as amended by the Additional Protocol of 28 January 1964, by the Protocol of 16 November 1982, and by the Protocol of 12 February 2004 and the Law …….....*

I

1. NUMÉRO DE CERTIFICAT……
CERTIFICATE NUMBER

2. NOM ET ADRESSE DE L'EXPLOITANT RESPONSABLE
NAME AND ADDRESS OF THE OPERATOR LIABLE

Nom…….
Name

Adresse……..

Address……..

3. MONTANT DE LA GARANTIE
AMOUNT OF THE SECURITY
……

……

4. TYPE DE GARANTIE
TYPE OF SECURITY

……

……

……

……

5. DURÉE DE LA GARANTIE
DURATION OF THE SECURITY

……

……

6. DÉSIGNATION DES SUBSTANCES NUCLÉAIRES COUVERTES PAR LA GARANTIE
NUCLEAR SUBSTANCES IN RESPECT OF WHICH THE SECURITY APPLIES

……

……

7. ITINÉRAIRE COUVERT PAR LA GARANTIE
CARRIAGE IN RESPECT OF WHICH THE SECURITY APPLIES

……

……

8. NOM ET ADRESSE DE L'ASSUREUR (OU DES ASSUREURS) ET (OU) DE LA (OU DES) PERSONNE(S) AYANT ACCORDÉ UNE GARANTIE FINANCIÈRE
NAME OF AND ADDRESS OF THE INSURER(S) AND/OR GUARANTOR(S)

Nom…….
Name

Adresse……..

Address……..

DÉLIVRÉ À …… LE…….. PAR
ISSUED IN *ON* *FOR OR ON BEHALF OF*

(a) Le (ou les) garant(s)
The guarantor(s)

Designation …….

Signataire et titre ……
Signer and title

(b) L'État [le cas échéant]
The State [*where applicable*]

Signataire et titre ……
Signer and title

II

Je soussigné, certifie que la personne visée au paragraphe 2 est un exploitant au sens de la Convention de Paris
I hereby certify that the party mentioned in Paragraph 2 is an operator within the meaning of the Paris Convention

Délivré à ……. Le ……. Par
Issued in *on* *for or on behalf of*

……

……

……

(L'Autorité publique compétente)
(The Competent Public Authority)

III

L'EXPLOITANT RESPONSABLE……
THE OPERATOR LIABLE……..

dont le siège est ……

whose address is ……

……

Certifie que le transport de substances nucléaires décrit ci-après est effectué pour son compte et qu'il est visé par la garantie mentionnée dans le Cadre I.
Certifies that the carriage of nuclear substances described hereinafter is carried out on his behalf and that such carriage is covered by the security mentioned in Part I.

DÉSIGNATION DES SUBSTANCES NUCLÉAIRES COUVERTES PAR LA GARANTIE
NUCLEAR SUBSTANCES IN RESPECT OF WHICH THE SECURITY APPLIES ……

……..

……..

……..

……..

ITINERAIRE COUVERT PAR LA GARANTIE
CARRIAGE IN RESPECT OF WHICH THE SECURITY APPLIES……

……..

……..

……..

……..

Délivré à …… le …….. par
Issued in *on* *for or on behalf of*
……..

……..

Signature :

L'exploitant responsable
The liable operator

NOTICE EXPLICATIVE
RELATIVE AU CERTIFICAT DE GARANTIE FINANCIÈRE
POUR LE TRANSPORT DE SUBSTANCES NUCLÉAIRES

CADRE I

En-tête

L'en-tête pourra comprendre une référence à l'autorité publique compétente du pays qui établit le certificat.

Paragraphe 2

Lorsque, conformément à l'article 4(e) de la Convention de Paris, la loi nationale prévoit que la responsabilité du transporteur peut être substituée à celle de l'exploitant normalement responsable, et qu'il est fait usage de cette faculté, le nom et l'adresse du transporteur devront remplacer ceux de l'exploitant.

Paragraphe 3

Le montant indiqué pour la garantie doit être par accident ; toutefois, s'il n'est pas possible d'obtenir une couverture par accident, il doit être précisé si la couverture est par période ou par voyage. Si le montant global de la garantie résulte de plusieurs garanties différentes, le montant de chacune d'elles doit être précisé. Le montant global de la garantie doit être conforme aux dispositions de l'article 7(a) et (b) de la Convention. Si la garantie financière résultant d'une assurance ou d'une autre source est insuffisante, les autorités nationales compétentes doivent indiquer l'importance des fonds mis à disposition par l'État ou les mesures complémentaires prises par celui-ci.

Paragraphe 4

Le certificat doit mentionner s'il s'agit d'une assurance (et, dans ce cas, préciser le numéro de la police) ou bien s'il s'agit d'une autre forme de garantie financière. Si la garantie est fournie sous plusieurs formes différentes, celles-ci doivent être énumérées y compris, le cas échéant, les fonds publics.

Paragraphe 5

L'inscription « durée de la garantie » doit préciser la date d'effet de la garantie. Il est rappelé, qu'aux termes de l'article 10(d) de la Convention, l'assureur ou le garant ne peuvent suspendre ou mettre fin à la garantie financière pendant la durée du transport.

Paragraphe 6

La description doit permettre d'identifier de façon précise les substances nucléaires faisant l'objet du transport. Toutefois, dans le cas où l'exploitant est titulaire d'une police d'assurance ou d'autres garanties couvrant en permanence toute une série de transports pendant une période définie, la description donnée au paragraphe 6 pourra être de caractère général, à condition que la Cadre III, d'usage facultatif, soit alors rempli et permette l'identification précise des substances nucléaires faisant l'objet du transport particulier pour lequel le certificat est délivré.

Paragraphe 7

Dans la mesure où les principaux points de passage du transport, en particulier aux frontières, sont connus par avance, ceux-ci doivent être indiqués. Le nom et l'adresse du destinataire pourront éventuellement être précisés.

Paragraphe 8

Lorsque la garantie constituée par une police d'assurance est complétée par une garantie accordée par l'État ou un autre garant, leur signature doit figurer au bas du Cadre I.

CADRE II

En certifiant que la personne désignée au paragraphe 2 du Cadre I est un exploitant au sens de la Convention de Paris, les autorités compétentes pourront également faire figurer les garanties fournies par l'État, ou les autres mesures prises par lui, pour assurer l'indemnisation des victimes, conformément à la Convention.

CADRE III

EXPLANATORY NOTICE
ON THE CERTIFICATE OF FINANCIAL SECURITY
FOR THE CARRIAGE OF NUCLEAR SUBSTANCES

PART I

Heading

If desired, the heading may include a reference to the competent public authority of the country where the Certificate is issued.

Item 2

Where, in accordance with Article 4(e) of the Paris Convention, national law provides that the carrier may be liable in place of the operator who would normally be liable and when use is made of that option, the name and address indicated should be that of the carrier rather than that of the operator.

Item 3

The amount of security indicated shall be per incident; if, however, per incident coverage is unobtainable, it must be indicated whether the coverage is per period or per carriage. If the total amount of security has been furnished by more than one source, the amount of each of them should be indicated. The total amount of security must conform to the provisions of Article 7(a) and (b) of the Convention. If the financial security furnished by insurance or from some other private source is insufficient, the competent national authorities should indicate the funds made available by the State or other supplementary measures taken by the State.

Item 4

The Certificate should stipulate whether the security furnished is by insurance (including in such cases the policy number) or whether such security is furnished in some other form. If security is furnished in several forms, these should be enumerated, including State funds.

Item 5

The entry "duration of the security" must stipulate the date on which such security takes effect. It should be recalled that article 10(d) of the Convention provides that no insurer or other financial guarantor shall suspend or cancel the financial security during the period of the carriage in question.

Item 6

The description given of the nuclear substances should be sufficiently complete to enable them to be positively identified. However, where the operator holds an insurance policy or other financial security providing continuous cover for a whole series of carriage for a defined period, a general description may be given in Item 6, provided that Part III, of optional use, is completed and enables the exact identification of the nuclear substances involved in the particular carriage for which the Certificate is delivered.

Item 7

The major points of transit should be indicated where known, notably the crossing of national borders. Where desired, the name and address of the consignee may also be given.

Item 8

Where the State or some other guarantor completes the security furnished by insurance, they must also sign at the bottom of Part I.

PART II

In certifying that the party mentioned in Item 2 of Part I is an operator within the meaning of the Convention, the competent authorities may also include mention of the security furnished by the State or of other measures which it has taken, to ensure the compensation of persons suffering damage, in conformity with the Convention.

PART III

Le Cadre III, d'usage facultatif, est rempli par l'exploitant lui-même lorsque la garantie figurant au paragraphe 6 du Cadre I fournit une couverture générale valable pour toute une série de transports. Le Cadre III vise alors le transport particulier dont il donne la description. Le Cadre III ne peut en aucun cas constituer à lui seul un certificat valable et il ne peut être utilisé qu'en complément du Cadre I.

Part III, of optional use, should be completed by the operator himself when the security mentioned in Item 6 of Part I provides general coverage for a whole series of carriage described therein. Part III may, in no case, constitute a valid certificate in itself and is only valid when used in conjunction with Part I.