

November 1969

TO ALL MEMBERS

The Britannia Steam Ship
Insurance Association Limited

Carriage of Nuclear Material on behalf of the United Kingdom Atomic Energy Authority

- 1 As Members will be aware, nuclear material, when carried by sea, falls into four classes:
 - (i) Natural uranium and thorium ores concentrates and metals; and mineral residues produced by the processing of such ores
 - (ii) Radioisotopes
 - (iii) Fissile material
 - (iv) Irradiated nuclear fuel and radioactive waste

(For further details relating to the above classes, see attached letter [Appendix I] circulated by your Club to its Members in 1960.)

- 2 This classification was evolved after discussion with representatives of the United Kingdom Atomic Energy Authority (the AEA) and in the result, it was agreed that the P&I Clubs would provide cover in respect of any liability arising during the carriage of nuclear material falling under classes (i) and (ii), whereas the AEA undertook to provide appropriate indemnities to individual shipowners who carried AEA consignments of class (iii) or (iv) materials.
- 3 This allocation of liability was intended to anticipate the eventual requirements of the OECD (Paris) Convention on third party liability which in 1960, was still under discussion. This Convention has now been ratified by the UK, Belgium, France, Spain, Sweden and Turkey and is now in force for those countries. Its provisions are reflected in the United Kingdom Nuclear Installations Act of 1965 which came into force on 1st December 1965. Some minor amendments were introduced and a raising of the limit of liability in respect of claims arising in non-relevant countries was made by the United Kingdom Nuclear Installations Act 1969.
- 4 Particular attention is drawn to the following provisions of the principal Act:
 - (a) Third party liability for any occurrence involving 'nuclear matter' (as defined) is channelled back to the operator of a nuclear installation. Third party liability is imposed on the operator where there is an 'occurrence' in the course of carriage of nuclear matter other than 'excepted matter' (Section 7 [2] [b] and [c] and Section 8 covering the AEA). The carrier is not liable.
 - (b) The liability of any UK operator to pay compensation in respect of any one occurrence is limited to £5,000,000 (Section 16 [1]).
 - (c) The Act does not impose liability on the operator in respect of nuclear injury or damage occurring within the territorial limits of any state which has not ratified the Paris Convention ('non-relevant' territory), other than for damage to British ships or aircraft or injury to persons or damage to property on board such ships or aircraft (Section 13 [2]).

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- (d) Where nuclear injury or damage occurs in a 'non- relevant' territory and a shipowner whose principal place of business is in a 'relevant' territory is held directly liable, he has the right to recover from the operator up to £5,000,000 (Section 13 [5]).
 - (e) When nuclear matter other than 'excepted matter' is carried, the operator must issue a Certificate of Financial Security (Nuclear Matter Transport Certificate) to the carrier before the carriage is begun (Section 21 [3]).
- 5 During the last two years discussions have taken place between representatives of the AEA, the Chamber of Shipping of the United Kingdom and the P&I Clubs in order that the existing arrangements may be adapted to comply with the provisions of the United Kingdom Nuclear Installations Acts.
- 6 Following the coming into force of these Acts, two particular matters required attention:
- (1) To reclassify nuclear substances into two categories ('nuclear matter' other than 'excepted matter' and 'excepted matter') as specified in the Act. (**Note:** Broadly speaking, classes [iii] and [iv] above fall within the 'nuclear matter' other than 'excepted matter' category and classes [i] and [ii] fall within the 'excepted matter' category.) (See Appendix II attached.)
 - (2) To renegotiate the present indemnity given by the AEA (**Note:** The present indemnity is issued for each shipment of class [iii] or [iv] material. This was necessary in order to protect the carrier in respect of any liability which, before ratification of the Paris Convention might fall on him. Under the Paris Convention and the United Kingdom Nuclear Installations Act the AEA is bound to provide the carrier with a Certificate of Financial Security [Nuclear Matter Transport Certificate] in respect of each shipment of nuclear matter other than 'excepted matter' [as defined] for which they are liable in circumstances covered by the Act. The Certificate sets out the name of the operator liable and specifies the amount of the fund available for third party claims at £5,000,000. Where, however, a nuclear occurrence takes place in circumstances which are not covered by the Paris Convention and the Act, for example, in the territorial waters of a country which has not ratified the Convention, a shipowner could be made liable in a sum exceeding £5,000,000. Although, under Section 13 [5] he would be able to recover up to £5,000,000, he could not recover the excess of this sum. It is for this reason that an indemnity is required from the AEA.)
- 7 As regards (1) above, the Rules of the undersigned Associations give the Committees and/or Directors discretion to permit the carriage of such nuclear substances as they consider justified. After the most exhaustive international discussions, it has been concluded that 'excepted matter' is innocuous and the AEA is not liable under the Act in respect of its carriage. In these circumstances, the Committees and/or Directors have agreed that cover should be extended to all substances falling under the category of 'excepted matter'.
- 8 As regards (2) above, it should be particularly noted that, with effect from 1st September 1969, individual indemnities will not be issued. Such a procedure is inappropriate in view of the provisions of the United Kingdom Nuclear Installations Act and, instead, an 'umbrella' indemnity has been negotiated with the AEA under which shipowners will be indemnified (up to a maximum of £50,000,000 per occurrence) in respect of any claim for which they may be found liable under the law of any country which has not ratified the Paris Convention. It is not thought necessary to comment in detail on the terms of this general indemnity which has been drafted in close consultation with representatives of the Clubs. Members should however, be assured that the indemnity given by the AEA follows, in general, the provisions of

the current indemnities and provides proper safeguards for shipowners who carry nuclear matter. It should, in particular, be stated that the AEA undertakes to indemnify any carrier (which term includes the owner, charterer, operator, manager or Master of a ship) up to a maximum of £50,000,000 in respect of claims, damage or injury as follows:

- (i) Any claim made on the carrier under the law of a country which is not a 'relevant' territory.
- (ii) Any claim made on the carrier by any other person under the terms of a sub-indemnity given by the carrier necessarily and in the normal course of business, where such other person has incurred liability under the law of a country which is a 'non-relevant' territory.
- (iii) Any damage to the means of transport or injury or damage incurred by persons or property on board the means of transport.

9 It will be noted (see [ii] above) that the necessity for carriers to give indemnities to stevedores, master porters, harbour authorities, etc has been recognised. Furthermore, since it is conceivable that ship agents and crew members might be sued in 'non-relevant' territories, the AEA has agreed that, where necessary, the sub-indemnity forms may be adapted appropriately to cover such persons.

10 The procedure to be followed when any nuclear substance is carried for the AEA will now be simplified. It will no longer be necessary, as heretofore, for shipowners to ascertain the nature of the substance, to decide upon its classification and (in appropriate cases) to obtain an indemnity from the AEA. In future, whenever 'nuclear matter' other than 'excepted matter', is to be carried for the AEA, whether in a British or a foreign flag ship, the shipowner will receive a Certificate of Financial Security (Nuclear Matter Transport Certificate), endorsed to show that the nuclear matter described in the Certificate is covered by AEA's indemnity when the transport of the consignment is within the territorial limits of a 'non-relevant' country. On the issue of this Certificate the shipowner will automatically be covered by the indemnity and the only action required is for the shipowner to issue sub-indemnities where these are given 'necessarily and in the normal course of business'. It should be unnecessary to give indemnities to port authorities, stevedores or other persons in countries which have ratified the Paris Convention, however, because the laws of these countries impose absolute liability on the operator in accordance with the provisions of the Convention. Furthermore, the Certificate of Financial Security together with the endorsement should provide evidence acceptable to foreign authorities both in 'relevant' and 'non-relevant' countries that adequate funds will be available for compensation to third parties in the event of an occurrence during the period of the maritime carriage. If no Certificate of Financial Security (Nuclear Matter Transport Certificate) is received, the shipowner will be entitled to assume that the nuclear substance which he is to carry is 'excepted matter' and that any liability which may arise, as a result of its carriage, will be covered by his P&I Club.

11 However, if the AEA, through an oversight, fails to issue a Certificate of Financial Security when it is required to do so, or if one is issued but not received by the shipowner, the AEA will remain liable under the Nuclear Installations Act or the indemnity for any nuclear occurrence arising during the course of carriage.

12 It is thought unnecessary to attach copies of the revised indemnity and sub-indemnities to this letter, which is merely for general information. If, however, it is anticipated by any member that he may carry nuclear matter for the AEA in the future, application should be made for such documents.

- 13 It should be stressed that the arrangements set out above relate only to the carriage of nuclear material for the United Kingdom Atomic Energy Authority. Where nuclear material is carried for any other authority, owners should ensure that they safeguard their position by obtaining adequate indemnities from the authority concerned.
- 14 In conclusion, it is thought that your attention should be drawn to the existing wording of the nuclear exclusion clause which is commonly inserted in Charter Parties and which is reproduced in Appendix III, attached. Now that nuclear material has been reclassified into two classes namely 'nuclear matter' and 'excepted matter', the Documentary Committee of the Chamber of Shipping of the United Kingdom is considering the advisability of redrafting the existing wording of the clause.

Issued by the Clubs comprising the International Group.

Appendix I

June 1960

Members are aware from the notices and circulars which have been issued that the Association's Rule relating to the carriage of radioactive materials is as follows:

'No Member shall be entitled to protection or indemnity in respect of any claim arising out of or in consequence of the emission of ionising radiations from or the toxic, explosive or other hazardous properties of nuclear fuels or radioactive products or waste carried in an entered ship, with the exception of radio isotopes which are used or intended to be used for any industrial, commercial, agricultural, medical or scientific purposes and are carried as cargo, and with such further exceptions as the committee shall approve.'

Upon the information now received, it appears that nuclear materials presently carried by sea, or likely in the future to be so carried, as cargo, fall into the following categories:

- (i) ***Natural uranium and thorium ores, concentrates and metals; and sludges and 'throwaway wastes' produced by the processing of such ores.***

The radioactive content in these substances is in such small concentration that the hazard is no greater than that of common lead.

'Throw-away waste' is the technical term applied to the residue which remains after the process of extracting the metal of uranium or thorium from the ore or concentrates. It is of negligibly slight radioactive capacity and is disposed of by dumping in the sea. It is, however, to be distinguished from the waste which constitutes the end product of a nuclear reactor; this is highly radioactive and, therefore, dangerous and falls under class (iv) overleaf.

- (ii) ***Radio isotopes.***

These are concentrated radioactive materials used for scientific research, and in medicine, agriculture and industry. For all these purposes radio isotopes are required only in small unit quantities, and indeed fifty units in one package would not produce a surface radiation in excess of that permitted under the British Ministry of Transport Regulations for the carriage of dangerous goods. The most highly radioactive of these substances are those used in teletherapy, mainly for the treatment of cancer: but again the unit quantities have to be small, otherwise they could not safely be handled.

(iii) *Fissile materials.*

These are artificially produced nuclear substances, such as enriched uranium, uranium 235 and plutonium 239. They are not 'irradiated' as is nuclear fuel in a reactor, but under certain conditions are capable of undergoing fission, which is the process by which nuclear energy is liberated.

The main danger from this class of nuclear substances is that, if ingested in the human body, they are highly toxic. This danger would only occur, of course, if the fissile material were (a) to escape from its container and (b) be in such a form that it could be ingested, e.g. a fine powder as opposed to a metal. In this context it appears that plutonium is usually in the form of a fine powder which, if disseminated in the atmosphere and so inhaled by human beings, would produce harmful effects. Plutonium, if ingested, settles in the bones and causes bone cancer.

Certain fissile materials are, however, also capable, if present in sufficient unit quantity, and in a certain geometrical arrangement, of giving rise to what is termed a 'criticality incident', i.e. very intense flashes of ionising radiation which are extremely harmful to persons, and can contaminate property. Fissile material of this nature is either transported in strong specially designed containers (in which event the criticality precautions depend essentially upon the container remaining intact during transport) or standard containers are used, but are limited in number in any one consignment to a quantity of fissile material which is considered safe (in which event the safety factor may be diminished if the consignment happens to be adjacent to a similar load on another means of transport).

(iv) *Irradiated nuclear fuel or waste.*

These substances are the end products from nuclear reactors. After the nuclear fuel in the reactor has been utilised to its economic extent for the production of energy, it is still highly radioactive and has considerable value in that products such as plutonium can be extracted from it. It has, therefore, to be transported from the reactor, where its useful life has ceased, to one of the few specially equipped atomic stations, at which it can be treated. This may, and does often, involve a long ocean carriage.

The maximum credible accident during such carriage could not, according to the Atomic Energy Authority, produce an atomic explosion; but it was admitted that, if as the result of a casualty during transport, irradiated nuclear waste were to be exposed, the radiation would be of such intensity as to cause grave, if not fatal injury to those in the vicinity and serious contamination of property. This type of nuclear substance is by far the most dangerous of those which are now being transported.

Upon consideration of this information, the Committee decided that, in determining whether or not the Association's cover should be extended to the carriage of a particular nuclear substance, the test to be applied was the nuclear properties of the substance itself and not the security of its package. If a nuclear substance is capable in its exposed state of emitting ionising radiations of such intensity as to present serious hazard to persons and property in the vicinity, the Association's cover ought not to be extended to the carriage of such substance whatever the nature of its packing. The possibility of a package or container, however strong, being penetrated or broken open in a marine casualty such as collision, stranding or fire, cannot prudently be excluded.

In these circumstances the Committee will, as at present advised, exercise its discretion under the amended Rule in favour only of nuclear materials which fall under classes (i) or (ii) viz, natural uranium or thorium, in the form of their ores, concentrates or metals (and the sludges and wastes resulting from the extraction of such metals) and radio isotopes.

Nuclear materials of class (iv) are, in the Committee's opinion, so inherently dangerous as to be absolutely excluded. However, the heavy containers in which this material is transported from nuclear installations for processing will, after intensive cleaning, be shipped back empty to the installations for refilling: in their empty state, therefore, these may be accepted for shipment under the Association's cover, but only if they have been certified by the proper authority to be free of radioactivity.

The Committee considers that no sufficient case has been established for the carriage, under the Association's cover, of fissile materials - class (iii).

Members are advised to apply to the Managers if in any doubt as to the category in which any particular parcel of nuclear material offered for shipment falls. The matter will be elucidated with the assistance of the Atomic Energy Authority if necessary: but it is hoped that a classified list of nuclear materials likely to be transported by sea will shortly be available.

Members are further strongly advised not to accept for shipment nuclear materials which do not fall within classes (i) or (ii) except under an unqualified indemnity from the shippers against any liability for nuclear damage occurring during the transport which the Member may incur. The indemnity should also cover the Member's liability to stevedores and owners and operators of lighters, tugs and cranes to whom indemnities are customarily given by shipowners. Members should assure themselves of the shipper's ability to implement such an indemnity.

As far as the Association is concerned, indemnities of these types given by Members will have in future, if countersigned by the Association, to contain the following clause:

'This indemnity shall not apply to any loss or liability of any kind whatsoever and howsoever caused arising out of or in consequence of the emission of ionizing radiation from or the toxic explosive or other hazardous properties of nuclear fuels or radioactive products or waste, unless and to the extent that we shall otherwise specifically agree in writing.'

Appendix II

Reclassification of nuclear substances.

Category I 'Nuclear Matter' other than 'Excepted Matter'.

- (a) Fissile material. Consignments of U235, U233, Pu 239 and Pu 241 (or mixtures, chemical alloys or compounds thereof) packed in
 - (i) Fissile class III packages (regardless of quantity); or
 - (ii) Fissile class I and II packages in excess of the following amounts:

	Uranium 235	Uranium 233	Plutonium 239	Plutonium 241
Packages containing fissile material in 'special form'	600 grams	375 grams	375 grams	4.375 grams
Packages containing fissile material in 'other than special form'	600 grams	375 grams	32 grams	0.0175 grams

- (b) Quantities of radioisotopes (other than those prepared for use for industrial, commercial, agricultural, medical or scientific purposes) or of any irradiated material or samples in excess of the following activities per consignment:

For radioactive substances
in transport group (as
defined in the transport
regulations)

Limit in Curies

I	2
II	20
III & IV	200
V	5,000
VI to VIII	50,000
'Special form'	500

Category II 'Excepted Matter'

- (a) Uranium and thorium ores and concentrates.
- (b) Natural or depleted uranium metal, thorium metal and alloys or chemical compounds thereof, unless the material has been irradiated in a nuclear reactor.
- (c) Radioisotopes prepared for use for industrial, commercial, agricultural, medical or scientific purposes.
- (d) Radioisotopes other than those in (c) above or irradiated material or samples where the activity per consignment is lower than the limits set out in category 1 (b).
- (e) Fissile material packed in fissile class I or II packages, where the consignment is within the limits set out in category I (a) (ii).

Appendix III

Nuclear exclusions clause.

'Notwithstanding any other provision contained in this charter, it is agreed that nuclear fuels or radioactive products or waste are specifically excluded from the cargo permitted to be loaded or carried under this Charter Party. This exclusion does not apply to radioisotopes used or intended to be used for any industrial, commercial, agricultural, medical or scientific purpose provided owners' prior approval has been obtained to the loading thereof.'