STELLUNGNAHMEN

Sea-Bed Disposal of High-Level Radioactive Waste

I. The 7th Consultative Meeting of the London Dumping Convention

The 7th Consultative Meeting of the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter – hereafter cited as London Dumping Convention (LDC)[1] – which took place from February 14 to February 18, 1983, was dominated by the discussions on the dumping of radioactive wastes at sea. As in the past dumping of nuclear waste has increasingly encountered protest. The dumping operations in the North Atlantic in recent years were opposed not only by environmental groups such as Greenpeace, but also by the Government of Spain. During the 7th Consultative Meeting a number of States proposed amendments to the LDC or resolutions to be adopted by the Contracting Parties aiming at a prohibition of the disposal of nuclear waste at sea or at least at a suspension of these activities for a certain time. Kiribati and Nauru made a joint proposal to amend the Annexes I and II of the LDC so as to prohibit totally the dumping of radioactive wastes[2]. Finland, speaking on behalf of the Nordic Countries, introduced proposals for an amendment of the Annexes which provided also for a prohibition of dumping of radioactive wastes, yet beginning with January 1, 1990[3]. The Government of Spain pleaded a suspension of the dumping practices until the necessary research and evaluation with regard to the effects of dumping of radioactive wastes to the marine environment was completed, and proposed a corresponding resolution[4].

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[1] Convention signed December 29, 1972; ILM 11 (1972), p.1291ff.; BGBl.1977 II, p.180ff. The Convention is in force since August 30, 1975, and had, on January 1, 1983, 52 States Parties, among them all the States with considerable dumping practice; cf. Report of the 7th Consultative Meeting, IMO Doc. LDC 7/WP.10, p.3.

[2] LDC 7/7.

[3] LDC 7/7/3.

[4] LDC 7/7/4.

Opposition against these proposals came from the United Kingdom which argued that there is no scientific and technical evidence demonstrating the need for a total ban on dumping of radioactive wastes; however, the United Kingdom would be ready to stop dumping of radioactive wastes when "clear evidence was found that such operations were harmful to the marine environment"[5]. Similar statements were made by several industrialized States, including the United States of America, the Federal Republic of Germany, Japan, the Netherlands, the Soviet Union, France, Canada, and Greece[6]. Due to this opposition, the initiatives of Kiribati and Nauru, as well as that of the Nordic Countries, had no success although both proposals had found the support of a considerable number of States, such as the Philippines, Ireland, New Zealand, Papua New Guinea, Nigeria, Panama, and Argentina[7]. The Meeting finally adopted a resolution proposed by Spain which clearly was a compromise: Dumping of radioactive wastes was to be suspended until a group of experts had studied and reported on the scientific basis of a prohibition of dumping of radioactive wastes[8]. The resolution was adopted by 19 votes to 6 with 5 abstentions; Japan, the Netherlands, South Africa, Switzerland, the United Kingdom, and the United States voted against, whereas Brazil, France, the Federal Republic of Germany, Greece, and the Soviet Union abstained[9].

Another problem which was discussed with relation to dumping of radioactive wastes, was the so-called "sea-bed disposal option". This new method of disposal is being studied at present time in several countries, not only for low-level radioactive wastes but also for high-level wastes and other ultra-hazardous substances which cannot be disposed of on land. Research and development is co-ordinated internationally by the Sea-Bed Working Group established within the Nuclear Energy Agency (NEA) of the Organisation for Economic Co-operation and Development (OECD). The reason why high-level radioactive wastes are included in the deliberations, is that in some States sea-bed disposal which means the implantation of the wastes in the sea-bed, is not considered "dumping" as defined in the LDC so that the prohibition of dumping high-level radioactive wastes is not applicable. Because of this uncertainty Norway proposed a resolution to the 7th Consultative Meeting according to which an intersessional meet-

[5] Report of the 7th Consultative Meeting, LDC 7/WP.10.
[6] *Ibid.*
[7] *Ibid.*
[8] LDC 7/7/4/Rev.1.
[9] Report of the 7th Consultative Meeting, LDC 7/WP.10.

ing of legal experts should be convened dealing with the question of the legality of "sea-bed emplacement"[10]. The meeting of legal experts has in the meantime taken place from December 12 to 14, 1983.

The following remarks concentrate on the problem of sea-bed disposal of radioactive wastes, but the question of legality of this new disposal method cannot be dealt with in all aspects and details. The main interest is to find an answer to the question of whether or not sea-bed disposal is "dumping", and in particular, whether or not sea-bed disposal of high-level radioactive wastes is consistent with the LDC.

II. Disposal of Radioactive Waste at Sea: Practice and Legal Basis

The practice of disposal of radioactive wastes at sea[11] began in 1946 by the United States which, until 1970, dumped wastes with an activity of about 95.000 curies. Most of these low-level wastes were dumped at two sites in the Atlantic Oceans off the coast of Maryland and Delaware, and on two sites in the Pacific a few miles off San Francisco, California. Until 1967 the United Kingdom dumped nuclear wastes with an activity of about 45.000 curies at several sites in the Atlantic. France and Japan are also reported to have carried out dumping operations in the fifties and sixties. In 1967 and 1969, and from 1971 on every year, low-level wastes have been dumped under the control and co-ordination of the NEA on a site in the North Atlantic about 700 km north-west of the Spanish coast. In 1967 the participating States were the United Kingdom, the Federal Republic of Germany, the Netherlands, Belgium and France; in 1969 Italy, Sweden and Switzerland joined, whereas the Federal Republic of Germany stopped its activities. Since 1971, only Belgium, the Netherlands, Switzerland, and the United Kingdom have regularly taken part in the dumping operations in the Atlantic. The quantity of the wastes dumped into the sea has increased every year, and until 1979, wastes with an activity of more than half a million curies have been dumped in the Atlantic. The low-level

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[10] LDC 7/WP.9.

[11] For more details see Robert S. Dyer, Sea Disposal of Nuclear Waste: A Brief History, in: Thomas C. Jackson (ed.), Nuclear Waste Management. The Ocean Alternative (New York etc.1981), p.9ff.; David A. Deese, Nuclear Power and Radioactive Waste (Lexington, MA, Toronto 1978), p.45ff.; Daniel P. Finn, Ocean Disposal of Radioactive Wastes: The Obligation of International Cooperation to Protect the Marine Environment, Virginia Journal of International Law 21 (1981), p.621ff.; S. A. Boehmer-Christiansen, Dumping Nuclear Waste into the Sea. International Control and the Role of Science and Law, Marine Policy 7 (1983), p.25ff.

wastes which have been dumped until today, are equipment and materials from all stages of the production of atomic energy, but also from the production of nuclear weapons, and from laboratories and hospitals.

The first legal regulations were established when the practice of dumping of radioactive wastes had been going on for more than a decade. The Geneva Convention on the High Seas adopted at the First United Nations Conference on the Law of the Sea in 1958, reads in Art.25:

> "(1) Every State shall take measures to prevent pollution of the seas from the dumping of radio-active waste, taking into account any standards and regulations which may be formulated by the competent international organizations.
>
> (2) All States shall co-operate with the competent international organizations in taking measures for the prevention of pollution of the seas or air space above, resulting from any activities with radio-active materials or other harmful agents".

These were only vaguely formulated obligations which could hardly influence practice in a significant way.

A more effective means of control of the disposal of radioactive waste at sea was created when, on December 29, 1972, the LDC was adopted[12]. The Convention prohibits dumping of certain wastes and substances considered as particularly dangerous (Art.IV (1) (a) and Annex I), whereas dumping of other substances may be permitted either with a "special permit" (Art.IV (1) (b) and Annex II) or with a "general permit" (Art.IV (1) (c)). Annex I contains the "black list" of prohibited matter, and this list includes also "high-level radioactive wastes or other high-level radioactive matter"; consequently dumping of these substances is prohibited, and may only be allowed according to the exemption clauses contained in Art.V (e.g. *force majeure*, danger to human life, emergencies[13]). According to Annex II ("grey list") dumping of "radioactive wastes or other radioactive matter not included in Annex I" may be permitted and, therefore, low-level radioactive waste may be disposed of at sea with a "special permit". Annex I of the LDC makes it a duty for the "competent international body, at present the IAEA", to define "on public health, biological or other grounds" the high-level radioactive wastes the dumping of which is prohibited, and to adopt recommendations for the issue of "special per-

[12] See note 1 above. For an evaluation of the Convention as a whole see Lothar Gündling, Rechtsprobleme der Abfallbeseitigung auf See, Natur und Recht 4 (1982), p.41ff.

[13] It may be added that according to the German Law on Dumping of Wastes By Ships and Aircraft of February 11, 1977 (BGBl.II, p.165ff.), dumping of wastes including those of Annex I may be permitted also in cases of "compelling public interests" (Art.2 (4)). This is a highly controversial provision, cf. Gündling, *op. cit.*, p.50.

mits" for the wastes and substances that may be dumped. The IAEA, having adopted, in 1975, "Provisional Definitions and Recommendations"[14], revised these Definitions and Recommendations in 1978[15].

The above-described concept for the treatment of radioactive wastes – prohibition of dumping of high-level radioactive wastes, "special permits" for other radioactive wastes – is not uncontested. Some member States of the LDC, in particular the United Kingdom, argue that for the purposes of waste disposal, the distinction between high-level radioactive wastes and low-level radioactive wastes as well as a definition based on initial concentrations is not useful and has no scientific basis; more important than initial concentrations, it is argued, are the release rates[16]. The majority of the member States, however, does not share this position, and until now has opposed an amendment to Annex I.

The Convention for the Prevention of Marine Pollution by Dumping from Ships and Aircraft, signed at Oslo on February 15, 1972, and entered into force on April 7, 1974 – Oslo Convention[17] –, does not mention radioactive wastes in its lists of substances, either in the "black list" or in the "grey list". This does not mean, however, that radioactive wastes are excluded from the regulatory framework; they may be included through one of the general categories of substances listed in Annexes I and II of the Oslo Convention[18]. Two other regional agreements which are also interesting in the European context, the Convention on the Protection of the Marine Environment of the Baltic Sea Area – Helsinki Convention[19] –, and the Convention for the Protection of the Mediterranean Sea against Pollu-

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[14] IAEA Doc. INFCIRC./205 and INFCIRC./205/Add.1.

[15] INFCIRC./205/Add.1/Rev.1, ILM 18 (1979), p.826ff.

[16] See Report of the 3rd Consultative Meeting of the LDC, IMCO Doc. LDC III/12, of October 24, 1978, ILM 18 (1979), pp.817ff. (818).

[17] ILM 11 (1972), p.262ff.; BGBl.1977 II, p.169ff.

[18] Annex I contains the following substances: organohalogen compounds, organosilicon compounds, substances "which have been agreed between the Contracting Parties as likely to be carcinogenic under the conditions of disposal", mercury, cadmium, and persistent plastics and other persistent synthetic materials; in Annex II the following substances are listed: arsenic, lead, copper, zinc and their compounds, cyanids and fluorides, and pesticides and their by-products not covered by Annex I, containers scrap metal, tar-like substances liable to sink to the sea bottom and other bulky wastes which may present a serious obstacle to fishing or navigation, and substances which, though of a non-toxic nature, may become harmful due to the quantities in which they are dumped or which are liable to seriously reduce amenities.

[19] Signed on March 22, 1974, entered into force on May 5, 1980, ILM 13 (1974), p.546ff.; BGBl.1979 II, p.1229ff.

tion – Barcelona Convention[20] – make specific reference to radioactive wastes. Although the Helsinki Convention does not include radioactive wastes in the "black list", "radioactive materials" are mentioned in the "grey list" of Annex II which means that these materials may be dumped with a "special permit". The Barcelona Convention, on the other hand, prohibits dumping of "high- and medium- and low-level radioactive matter to be defined by the IAEA", and allows dumping of other radioactive substances provided that a permit is issued for these substances.

In 1977 the Council of the OECD adopted a Multilateral Consultation and Surveillance Mechanism for Sea Dumping of Radioactive Waste[21], the purpose of which is to foster the objectives of the LDC (Art.1). According to this Mechanism, the NEA is obliged to adopt standards, guidelines, recommended practices and procedures for the safe dumping of radioactive waste at sea; to assess and keep under review studies made of the environmental, ecological and radiological protection aspects of sea dumping of radioactive wastes; and to assess and review the suitability of both used and proposed disposal sites. The participating States assume the obligation to notify NEA of their dumping operations, and accept that a representative of the Director General be present during the dumping operation in order to verify that the operation is in accordance with the provisions of the Mechanism.

III. The Sea-Bed Disposal Option and the LDC

For several years, a new method of disposing of radioactive wastes has been under discussion, in particular in the United States, namely that of implanting radioactive wastes in the sea-bed[22]. Different techniques are under consideration, e.g. implantation through penetration by gravity projectiles (penetrometers), through winch-controlled fall and penetration, or implantation in drilled holes. The advantages expected from this new method of "sea-bed emplacement", are said to be that radioactive wastes could be isolated almost totally from the human environment, in particular

[20] Signed with Protocol on the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, and the Protocol Concerning Co-operation in Combatting Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency, on February 16, 1976, ILM 15 (1976), p.285ff. The Convention and the two Protocols became effective on February 12, 1978.

[21] Decision of the Council of July 22, 1977, ILM 17 (1978), p.445ff.

[22] See Deese (note 11), p.11ff.; Finn (note 11), p.642ff.; Boehmer-Christiansen (note 11), p.33.

when using the flat, inaccessible and biologically unproductive deep ocean floor in the central regions of tectonic plates. Because of this optimistic evaluation it is also under consideration to implant in the sea-bed high-level radioactive wastes and other ultra-hazardous substances which cannot be dumped on land without serious risks for the environment. High-level radioactive wastes come principally from the highly radioactive fuel rods used in nuclear power plants. By reprocessing spent fuel rods, unused uranium and plutonium can be removed, but the reprocessing procedure leaves behind highly radioactive fission products as well as certain quantities of uranium, plutonium and other transuranic elements. Transuranics may loose their radioactivity only after hundreds of thousands of years; Plutonium 239, one of the most toxic transuranics, has a half-life of 24.000 years, which means it takes 24.000 years to loose half of its radioactivity, and another 24.000 years to loose half of the remaining activity etc.

An answer to the question whether "sea-bed emplacement" of radioactive wastes, and in particular the emplacement of high-level radioactive wastes, is consistent with the LDC, depends, first of all, on whether or not "sea-bed emplacement" is to be considered "dumping" within the meaning of the Convention. To answer this question in the affirmative would mean that emplacement of high-level radioactive wastes cannot take place.

Art. III of the LDC defines "dumping" as

> "any deliberate disposal at sea of wastes or other matter from vessels, aircraft, plat-forms or other man-made structures at sea".

In the French text of the Convention, the definition reads:

> «‹Immersion› signifie: tout rejet délibéré dans la mer de déchets et autres matières à partir de navires, aéronefs, plate-formes ou autres ouvrages placés en mer».

In Spanish, an authentic language of the Convention along with English and French, "dumping" is defined as follows:

> «Por ‹vertimiendo› se entiende: toda evacuación deliberada en el mar de desechos u otras matieres effectuadas desque buques, aeronaves, plataformas u otras construcciones en el mar».

The definition of "dumping" in the LDC is open to different interpretations; it may be understood in both a narrow and a wider sense. The English text suggests an interpretation of the definition covering all activities which are effected "at sea". According to this interpretation, which may be considered the wider one, recently developed disposal methods like incineration at sea or implantation of wastes in the sea-bed may easily be identified as "dumping" within the Convention. However, taking the French or Spanish definition it may be argued that "dumping"

means only those activities by which wastes are introduced "into the sea" and remain "in the sea". And if, in addition, "sea" is also understood in a narrow sense so as to mean only the water column and the surface area of the sea-bed, then implanting wastes in the sea-bed could be regarded as a disposal method which is not "dumping", but which is a method comparable to that of disposing of wastes in geological formations on land.

Yet, such a narrow interpretation raises questions and doubts with regard to the objects and purposes of the LDC. As can be seen from the preamble and the fundamental provisions of Arts.I and II, the purpose of the Convention is to protect the marine environment as a whole, and not only parts of it, against the dangers resulting from the disposal of wastes and hazardous substances. Art.I, furthermore, clearly shows that the marine environment is to be protected against any danger resulting from waste disposal thus aiming at a comprehensive protection of the marine environment against these dangers. The fact that the sea-bed and subsoil are also protected and are considered part of the marine environment, is evidenced by that part of the preamble which makes reference to Resolution 2749 (XXV) of the General Assembly of the United Nations on the Principles Governing the Sea-Bed and the Ocean Floor and the Subsoil thereof beyond the Limits of National Jurisdiction. Moreover, the general practice of the United Nations as laid down in resolutions, suggests that the term "marine environment" be understood so comprehensively as to mean not only the water column but also the sea-bed and subsoil[23]. A number of treaties may be added here defining "marine environment" in a similar way, e.g. the Convention on the High Seas of 1958[24], the Sea-Bed Treaty of 1970[25], the Helsinki Convention of 1974[26], the Barcelona Convention of 1976[27], and the Kuwait Convention of 1978[28]. Finally, the new Convention on the Law of the Sea, adopted on December 10, 1982, contains a number of provisions clearly indicating that the water column, sea-bed and subsoil are always considered a unity[29]. Therefore, one can only come to the conclusion that the term "marine environment" means both

[23] General Assembly Res.2340 (XXII); 2467 (XXIII); 2574 (XXIV); 2749 (XXV); 2750 (XXV); 2881 (XXVI); 3029 (XXVII); 3016 (XXVII); 3067 (XXVIII); 3171 (XXVIII); ECOSOC Res.1737 (LIV); UNCTAD Res.51 (III).

[24] Art.24.

[25] Art.I.

[26] Art.10.

[27] Art.7.

[28] Art.VII.

[29] E.g. Arts.2(2); 34(1); 49(4); 56(1) (a).

the water column and the sea-bed and subsoil, and that "dumping" as defined in the LDC is to be interpreted so as to cover all activities by which wastes are introduced into and remain in the marine environment. Thus, implanting wastes in the sea-bed constitutes "dumping" within the LDC.

IV. Revision of the LDC?

It may now be time to consider – and in some States corresponding proposals have been made – amending the LDC so as to allow the implantation of high-level radioactive waste in the sea-bed. Although this must be regarded a legitimate route for the Contracting Parties of the LDC to take, some caveats should be expressed here. An amendment allowing sea-bed implantation of high-level radioactive waste should not be adopted until reliable scientific studies are available confirming that the implanted wastes can really be isolated from the environment, and that there are no reasonable grounds for suspecting eventual damage to the environment. It would be irresponsible to take the other way, allowing sea-bed disposal of high-level radioactive wastes and to stop it only when there is evidence that risks are to be feared. It seems that the latter is a principle which is followed by the Government of the United Kingdom with regard to dumping at sea[30]; but it is a principle which is inappropriate for both the protection of the seas and the protection of the environment in general. There is no doubt that in the past States have widely acted in this way; on both the national and international level, activities with detrimental impacts on the environment have been allowed without seriously considering the possible effects on the environment and possible damage in particular. In the meantime, however, environmental degradation has reached such a threatening level that it is now timely if not overdue to take the other approach: Any activity which may degrade the environment must be assessed in advance with regard to its impact on the environment; and such activity may be carried out only when it has been confirmed by solid scientific studies that no damage to the environment is to be expected. Caring for the environment in this way is a duty we owe particularly to our children, who should be entitled to expect that the earth will still be worth living on.

Lothar Gündling

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[30] Cf. e.g. the statement of the representative of the United Kingdom at the 7th Consultative Meeting, Report, LDC 7/WP.10, p.18.