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RUSSIAN DUMPING OF RADIOACTIVE WASTES IN THE SEA OF JAPAN: AN OPPORTUNITY TO EVALUATE THE EFFECTIVENESS OF THE LONDON CONVENTION 1972

James R. McCullagh

Abstract: By dumping 900 tons of radioactive waste into the Sea of Japan on October, 13, 1993, the Russian navy violated the moratorium on low-level radioactive waste dumping of the London Convention (the international treaty controlling ocean dumping). However, legal liability under the London Convention, the 1982 United Nations Convention on the Law of the Sea, and international customary law arguably does not attach to this activity. Indeed, even though the London Convention was amended in November of 1993 to prohibit all ocean dumping of radioactive waste, Russia remains legally entitled to use the ocean as a disposal site for low-level wastes as a result of its formal objection to the amendment. Further, it is suggested that activity and ecosystem-specific regulations merely transfer the risks associated with the activity and may actually result in greater environmental harm. For this reason, the London Convention and indeed all international agreements should consider the global impacts of environmental regulations prior to prohibiting an activity.

I. INTRODUCTION

This Comment evaluates the current effectiveness of international regulations over ocean dumping of radioactive wastes ("radwastes") and questions the environmental soundness of prohibiting ocean disposal of low-level radioactive wastes. It appears that the precautionary approach, which allows activities to be regulated before proof of harm is established,¹ was instrumental in enabling the international community to prohibit ocean dumping of low-level radwaste. However, this Comment uses the 1993 prohibition of ocean dumping of all radioactive wastes by the parties to the London Convention² (formerly referred to as the London Dumping

¹ See generally Bernard Weintraub, *Science, International Environmental Regulation, and the Precautionary Principle: Setting Standards and Defining Terms*, 1 N.Y.U. ENVTL. L.J. 173 (1992); Gregory Fullem, Comment, *The Precautionary Principle: Environmental Protection in the Face of Scientific Uncertainty*, 31 WILLAMETTE L. REV. 495 (1995).

² Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matters, Dec. 29, 1972, [1975], 26 U.S.T. 2403, [hereinafter London Convention]. On November 12, 1993, parties to the London Convention adopted a worldwide prohibition on the dumping of all radioactive wastes. *Countries Agree to Bans on Dumping of Radioactive, Industrial Wastes at Sea*, 218 DAILY ENV'T REP. (BNA) d-7, Nov. 15, 1993, available in WESTLAW, BNA-ENV Database. [hereinafter *Countries Agree to Ban*]; See *Amendments to The Annexes to The Convention on The Prevention of Marine Pollution by Dumping of*

Convention) to illustrate the potential danger in adopting a precautionary approach on an ecosystem-specific basis. Restricting the precautionary approach to a single activity in a single ecosystem ignores the fact that risks to human health and the environment have not been eliminated but merely transferred to another ecosystem. Thus, proper application of the precautionary approach requires a global evaluation of risk.

Recently released information detailing past Russian violations of ocean dumping regulations,³ in addition to the precarious nature of the current Russian radwaste disposal program,⁴ warrants evaluating the environmental soundness of international ocean dumping regulations. In addition, the risks associated with radioactive waste disposal remain as the use and development of nuclear technology continues despite the lack of adequate permanent and safe disposal sites.

Ocean disposal was once thought to be an easy, cheap, and safe method for radwaste disposal.⁵ Increasing scientific understanding of the physical, chemical, and biological processes of oceans, popular perceptions of the dangers of radioactivity, and the increasing use of precautionary principles in environmental regulations have all contributed to increasingly prohibitive regulations on ocean dumping of radioactive waste.

Suspicion of Soviet use of the ocean as a dumping ground for radioactive waste was confirmed in 1993 when Russia released a white paper disclosing the extent and location of its past dumping activities.⁶ In October 1993, the Russian navy was observed dumping 900 tons of low-

Wastes and Other Matter, 1972 Concerning Disposal at Sea of Radioactive Wastes and Other Radioactive Matter, Resolution LC.51(16) (Nov. 12, 1993) [Feb. 20, 1994] [hereinafter *Amendments*].

³ William J. Broad, *Soviet Dumping of A-Waste*, SAN FRANCISCO CHRONICLE, Apr. 27, 1993, at A1, available in WESTLAW, FARNEWS Database; *Facts and Problems Related to Radioactive Waste Disposal in Seas Adjacent to the Territory of the Russian Federation*, OFFICE OF THE PRESIDENT OF THE RUSSIAN FEDERATION (Moscow, 1993) [hereinafter *Facts and Problems*]. Russia detailed the dumping of 18 decommissioned nuclear reactors and 13,150 containers of radioactive waste. Russia estimates it dumped approximately 2.5 million curies of radioactive waste (where one curie is equal to the amount of radiation given off by one gram of radium or the disintegration of 37 billion atoms per second), which is almost twice the total previously thought to have been dumped at sea by the rest of the nuclear nations from 1946 to 1982. The amount of radioactivity in curies dumped in the ocean by other countries in decreasing order are: Britain (948,042), Switzerland (119,441), United States (94,598), Belgium (57,306), France (9,551), Netherlands (9,082) Japan (417), Sweden (88), New Zealand (28), Germany (5), and Italy (5). South Korea has also dumped 115 containers of radioactive waste at sea but the level of radioactivity was not reported. *Id.*

⁴ See Jeffrey Canfield, *Soviet and Russian Nuclear Waste Dumping in the Arctic Marine Environment: Legal, Historical, and Political Implications*, 6 GEO. INT'L ENVTL. L. REV. 353 (1994).

⁵ See John W. Kindt, *Ocean Dumping*, 13 DEN. J. INT'L L. & POL'Y 335 (1984).

⁶ *Facts and Problems*, *supra* note 3.

level liquid radioactive wastes into the Sea of Japan.⁷ In 1994 Russian objections to a permanent ban on ocean dumping of low-level radioactive wastes further heightened international concern about the legality of Russia's dumping activities.⁸

This Comment contends that while Russia's 1993 low-level radwaste dumping did not conform to international standards, its actions were consistent with plausible interpretations of international law. Part II of this Comment provides background information on the development of ocean dumping regulations, the historical development of regulating ocean dumping of radioactive wastes, and on international law controlling ocean disposal of radwaste. Part III evaluates the international legality of Russia's actions in dumping low-level radwastes into the Sea of Japan in 1993. Part IV describes the problems associated with an activity and ecosystem-specific approach to environmental regulations and suggests that in order to effectively minimize the global risk to human health and the environment, a proper application of the precautionary approach should consider both the direct and indirect global impacts of an activity.

II. BACKGROUND

A. *The Development of International Regulation of Ocean Dumping*

The search for areas and methods of safe disposal of the radioactive byproducts of nuclear technology coincided with the development of nuclear power in the 1940s. The United States pioneered ocean disposal of radioactive wastes in 1946,⁹ continued dumping wastes until 1970,¹⁰ and

⁷ *Japan Demands End to Russian Nuclear Dumping; Moscow Stands Firm, Saying Parties Were Forewarned*, SAN FRANCISCO EXAMINER, Oct. 18, 1993, available in WESTLAW, ALLNEWS Database [hereinafter *Japan Demands End*]. The Sea of Japan is the body of water bordered by Japan on the east and South Korea, North Korea, and Russia on the west. South Korea has recently requested that the Sea of Japan be renamed to the Far East Sea, but the International Atomic Energy Association (IAEA) has refused to accept the proposed name change, citing that most international maps use the name "Sea of Japan." *South Korea Proposes Renaming of Sea of Japan*, BBC SUMMARY OF WORLD BROADCASTS, Sept. 25, 1995, available in LEXIS, NEWS Library, BBCSWB File.

⁸ *Declarations of Non-Acceptance of Amendments*, LC 18/2 (1994) [hereinafter *Declarations of Non-Acceptance*]. "The Russian Federation, in a declaration of 18 February 1994, expressed that: '... the Russian Federation does not accept the amendment to Annexes I and II to the Convention ... as contained in Resolution LC.51(16) ... Russia will, however, continue its endeavors to ensure that the sea is not polluted by the dumping of wastes and other matter, the prevention of which is the object of the provisions contained in the above-mentioned amendment ...'" *Id.*

⁹ Broad, *supra* note 3.

remained a proponent of ocean disposal of low-level radwaste until 1993.¹¹ Given the fact that the ocean's capacity to absorb wastes was considered limitless,¹² it is not surprising that many of the earth's nuclear powers have disposed of radioactive waste in the ocean.¹³

However, the general awakening to environmental concerns in the early 1970s and the impacts from industrial development and population growth revealed that the assimilative capacity of the oceans was finite.¹⁴ The international community identified the need to regulate the use of the oceans as a public dump and as a result, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (The London Convention) was signed by sixty states in 1972.¹⁵

The delegates at the London Convention recognized that "marine pollution originates in many sources, such as dumping and discharges through the atmosphere, rivers, estuaries, outfalls and pipelines,"¹⁶ but limited the scope of their discussions "to control the pollution of the sea by dumping."¹⁷

B. *History of Ocean Disposal of Radioactive Waste*

Ocean dumping of high-level radwaste was prohibited in the original London Dumping Convention,¹⁸ but developing acceptable protocol for ocean disposal of low-level radwaste has proven to be much more difficult. In general, states with nuclear capabilities favored ocean disposal of low-

¹⁰ George D. Haimbaugh, Jr., *Protecting the Seas From Nuclear Pollution*, 33 S. CAROLINA L. R. 197, 201 (1981).

¹¹ *Administration to Call for Global Ban on Dumping of Low-Level Waste in Oceans*, INT'L ENV'T. DAILY (BNA), Nov. 8, 1993, available in WESTLAW, BNA-IED Database [hereinafter *Administration*].

¹² Kindt, *supra* note 5, at 335 (citing Council on Env'tl. Quality, Env'tl. Quality - 1980 15 (1980)).

¹³ See Broad, *supra* note 3 and accompanying text.

¹⁴ Kindt, *supra* note 5, at 335. The growing awareness and concern for the environment is also evidenced by the increase in the level and number of regulations attempting to preserve and protect the environment. E.g., WILLIAM RODGERS, ENVIRONMENTAL LAW, viii (2 Ed. 1994). Multilateral environmental treaties were signed as a rate of 1.23 annually from 1920 to 1973 but increased to 4.2 annually for the period from 1974 to 1990. *Id.* §1.1 (Supp. 1995).

¹⁵ London Convention, *supra* note 2. As of 5 May, 1994, 72 countries (including 67 of the 149 countries that are members of the International Maritime Organization ("IMO")) have ratified the London Convention. IMO NEWS #2 (1994). This Convention has formerly been referred to as the "London Dumping Convention" but the Parties to the Convention recently agreed to change the informal name to the "London Convention of 1972." WILLIAM BURKE, INTERNATIONAL LAW OF THE SEA, DOCUMENTS AND NOTES 4-115 (1995).

¹⁶ London Convention, *supra* note 2, pmbl.

¹⁷ London Convention, *supra* note 2, pmbl.

¹⁸ London Convention, *supra* note 2, annex I. See also Kindt, *supra* note 5, at 343.

level radwaste, while states without nuclear capabilities opposed such activities.¹⁹ Countries possessing nuclear technology were concerned with developing economic methods for disposing of their growing stockpiles of radioactive waste and most nuclear powers had utilized the oceans as a disposal site for low-level radwastes.²⁰ On the other hand, non-nuclear coastal states feared that ocean disposal of radwaste would detrimentally affect the ocean resources upon which they depend.²¹

Motivations for ocean dumping of radwaste include limited terrestrial options of geographically disadvantaged countries, an inability or unwillingness to commit the necessary economic resources required for safe containment and land disposal, a belief that the ocean is a common resource constituting an inexpensive disposal option, and a belief by some that ocean dumping does not threaten the health of the marine environment.²² For example, Russia has vast sparsely populated terrestrial resources and is therefore not limited by suitable terrestrial options for radwaste disposal. However, the Russians have not committed sufficient economic or technical resources to develop safe land based storage facilities.²³ As a result, it is likely that ocean disposal of radioactive wastes remains attractive to the Russians from both an economic and risk sharing standpoint.

On the other hand, Japan, is heavily dependent on the ocean for transportation²⁴ and food,²⁵ but has limited natural resources. Japan utilizes

¹⁹ See Jon Van Dyke, *The United States and Japan in Relation to The Resources, The Environment, and The People of The Pacific Island Region*, 16 *ECOLOGY L.Q.* 217, 223 (1989). From a cost-benefit analysis, ocean disposal allows nuclear states to externalize the costs associated with nuclear energy by spreading the risks of radioactive byproducts throughout the vast expanse of the ocean. Non nuclear coastal states can be expected to object to sharing the risk of radioactive waste disposal as they receive none of the benefits associated with nuclear technology. See John W. Kindt, *International Environmental Law and Policy: An Overview of Transboundary Pollution*, 23 *SAN DIEGO L. REV.* 583, 587 (1986).

²⁰ Judith Spiller & Cynthia Hayden, *Radwaste at Sea: a New Era of Polarization or a New Basis for Consensus?*, 19 *OCEAN DEV. & INT'L L.* 345, 347 (1988). "Beginning in the late 1940's, the United States, the United Kingdom, France, Japan, the Federal Republic of Germany, the Netherlands, Belgium, Switzerland, Sweden, Italy, and South Korea had all disposed of low-level wastes at sea." *Id.*

²¹ *Id.* at 347.

²² See generally Sonja Boehmer-Christiansen, *An End to Radioactive Waste Disposal 'at Sea'?*, *MARINE POLICY*, Apr. 1986, at 119.

²³ See George Lobsenz, *Russia Counts Radioactive Costs of Cold War*, 24 *Energy Daily* 1 (1996) available in WESTLAW, ALLNEWS Database. Radioactive discharges from Russia's three nuclear reprocessing plants alone are reported to be 1.7 billion curies, which dwarf both the 80 million curies released in the Chernobyl accident and the 2.5 million curies dumped in the oceans. *Id.*

²⁴ See generally Baruch Boxer, *Marine Environmental Protection in the Seas of Japan and Okhotsk*, 20 *OCEAN DEV. & INT'L L.* 193 (1989). "Japan's maritime fleet of 37,189,376 Gross Registered Tons (1985) is the world's largest, except for Liberia's and Panama's largely flag-of-convenience registrations." *Id.* at 199.

nuclear energy to satisfy a portion of its energy demands and therefore shares concerns regarding the safe storage of radioactive wastes with other nuclear states. However, developing suitable terrestrial disposal sites is more difficult for Japan than other nuclear nations as a result of its limited land resources, relatively dense population, and extensive vulnerability to seismic perturbations.²⁶ As a result, even though contaminated sea food would have disastrous effects on Japan's population, Japan routinely expressed an interest in pursuing ocean dumping of radwaste until 1993.²⁷

Indeed, the current restrictions on ocean disposal of radioactive wastes can be traced back to Japan's 1979 announcement that it planned to dump low-level radwaste in the Pacific 900 kilometers southeast of Tokyo and 100 kilometers north of the nearest island in the commonwealth of the Mariana Islands.²⁸ Japan never commenced dumping operations as a temporary moratorium on ocean dumping of radioactive wastes was implemented by the parties to the London Convention in response to objections from Pacific island nations.²⁹

In 1983, at the Seventh Consultative Meeting of the London Convention, the Pacific island nations of Nauru and Kiribati attempted to convert the temporary moratorium into a permanent prohibition.³⁰ However, opposition to prohibiting all ocean dumping of low-level radwaste came from the United Kingdom, Belgium, France, Japan, Switzerland, and the United States.³¹ Convention members postponed voting on a permanent prohibition, but agreed that all countries would

²⁵ With an annual per capita consumption of 66.6 kilograms, Japan has the world's biggest appetite for fish. Michael Parfit, *Diminishing Returns*, NAT'L GEOGRAPHIC, Nov. 1995, at 2, 12. Japan imports more than 400 different types of seafood daily from 60 countries on 6 continents. T.R. Reid, *The Great Tokyo Fish Market Tsukiji*, NAT'L GEOGRAPHIC, Nov. 1995, at 41, 44.

²⁶ Van Dyke, *supra* note 19, at 224.

²⁷ Peter Hadfield & Debora MacKenzie, *Nuclear Dumping at Sea Goads Japan Into Action*, NEW SCIENTIST, Nov. 6, 1993, at 6.

²⁸ Spiller & Hayden, *supra* note 20, at 346. It has been suggested that Japan may have joined the London Convention in 1980 as a way to give legitimacy to Japan's ocean dumping plans. Van Dyke, *supra* note 19, at 223.

²⁹ Van Dyke, *supra* note 19, at 223.

³⁰ Spiller & Hayden, *supra* note 20, at 347; see also George C. Kasoulides, *State Responsibility and Assessment of Liability for Damage Resulting from Dumping Operations*, 26 SAN DIEGO L. REV. 497, 499 (1988).

³¹ Spiller & Hayden, *supra* note 20, at 347. While the United States had ceased ocean disposal of radwaste in 1970 and had enacted domestic bans for ocean disposal of low level radioactive waste, it remained opposed to international prohibitions on low-level waste disposal until 1993. The reservation against an international prohibition has been attributed to the Navy wanting to preserve the option of scuttling nuclear-powered submarines at sea and thinking that it would be more difficult to change international law. *Administration*, *supra* note 11.

refrain from ocean disposal of radioactive wastes pending the outcome of a scientific review.³² The resulting scientific panel produced an inconclusive report in time for the Ninth Consultative Meeting of the London Convention in September 1985,³³ and consequently the attending parties extended the moratorium on dumping low-level wastes for an indefinite period pending further review.³⁴

Despite no new scientific evidence on the dangers of ocean disposal of low-level radioactive wastes, the parties to the London Convention amended the Convention in 1993 to permanently prohibit ocean dumping of all types of radioactive wastes. The following three events help explain why the prohibition occurred in 1993. First, the parties at the Ninth Consultative Meeting in 1985 agreed that review of radioactive waste dumping restrictions would evaluate political, legal, economic, and social aspects in addition to scientific aspects of radwaste disposal.³⁵ Second, the Convention adopted the principles of the precautionary approach in November of 1991.³⁶ Third, the Russian disclosure of past ocean dumping transgressions and the Sea of Japan dumping incident both occurred in 1993 prior to the London Convention meeting.

Expanding the scope upon which regulations could be based to include social and political concerns in addition to scientific and technical matters, combined with growing acceptance of the precautionary approach, allowed the parties to the Convention to react to Russia's actions by permanently prohibiting ocean disposal of radioactive waste, despite the lack of supporting scientific data.³⁷ However, the effectiveness of enacting a permanent prohibition is currently unknown. Russia filed an objection to

³² *Disposal of radioactive wastes and other radioactive matter at sea*, Resolution LDC.14(7) (1983) (available in *THE LONDON DUMPING CONVENTION: THE FIRST DECADE AND BEYOND* 207 (1991) [hereinafter *THE FIRST DECADE*]). The moratorium was both voluntary and non-legally binding. *Id.* at 104.

³³ Kasoulides, *supra* note 30, at 499 (citing *Report of Intersessional Activities relating to the Disposal of Radioactive Wastes at Sea, including the Final Report of the Scientific Review*, LDC/9/4, June 24, 1985).

³⁴ *Dumping of Radioactive Wastes at Sea*, Resolution LDC.21(9) (1985) (available in J.M. Bowers & C.J.R. Garrett, *Analysis of the Issues Related to Sea Dumping of Radioactive Wastes*, MARINE POLICY, Apr. 1987, at 105, 124; *THE FIRST DECADE*, *supra* note 32, at 208, 209.)

³⁵ *Id.*

³⁶ *The Application of a Precautionary Approach in Environmental Protection Within the Framework of the London Dumping Convention*, Resolution LDC.44(14) [hereinafter LDC.44(14)]. See BURKE, *supra* note 15, at 4-115. "The adoption of the precautionary approach constitutes a shift from the traditional assimilative capacity approach where disposal of waste at sea is permissible unless proof of harm [is established]." *Id.*

³⁷ See *supra* note 34 and accompanying text.

the prohibition and is therefore not bound by the Convention's total prohibition on radioactive dumping.³⁸

C. *International Law Pertaining to Ocean Disposal of Radioactive Waste*

The safe operation of nuclear reactors and disposal of the associated radioactive wastes is of worldwide concern. Even though nuclear accidents and atomic testing may occur entirely within the sovereign territory of one state, the potential for transboundary pollution results in international concern over the effects of radioactive emissions from such operations.³⁹

In addition to specific prescriptions set forth in the London Convention, nation states may also be subject to regional agreements, the prescriptions of the 1982 Convention on the Law of the Sea ("UNCLOS"),⁴⁰ and general principles of customary law. While customary law applies to all states and sets the floor for acceptable international behavior, regional agreements, UNCLOS, and the London Convention only govern the legality of actions conducted by states that have expressly agreed to abide by their terms and conditions.

1. *The London Convention*

The London Convention governs actions on "all marine waters other than the internal waters to States,"⁴¹ and pertains to any deliberate disposal at sea of wastes, vessels, aircraft, platforms, or other matter.⁴² Thus, parties

³⁸ France, Belgium, Russia, China, and the United Kingdom abstained from the vote. *Countries Agree to Ban*, *supra* note 2. Only Russia filed the required opposition within 100 days. *Declarations of Non-Acceptance*, *supra* note 8. The import of Russia's opposition is discussed *infra* Part C.1.a.

³⁹ See Kindt, *supra* note 19.

⁴⁰ UN Doc. A/Conf.62/122 (1982) [Nov. 16, 1994], 21 I.L.M. 1261 (1982). [hereinafter *Law of the Sea*]. Eighty three states have ratified or acceded to the treaty as of December 1, 1995. (current membership status is available on the World Wide Web at gopher://gopher.un.org:70/00/los/unclosstatus/los82.rat).

⁴¹ London Convention, *supra* note 2, art. III, § 3.

⁴² London Convention, *supra* note 2, art. III, § 1(a). However, "dumping" for the purposes of the London Convention does not include: "(i) the disposal of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment, other than wastes or other matter transported by or to vessels, aircraft, platforms or other man-made structures at sea, operating for the purpose of disposal of such matter or derived from the treatment of such wastes or other matter on such vessels, aircraft, platforms or structures: (ii) placement of matter for a purpose other than the mere disposal thereof, provided that such placement is not contrary to the aims of the Convention." London Convention, *supra* note 2, art. III, § 1(a).

to the London Convention have relinquished sovereignty over regulating intentional disposal (not incidental to the operations of vessels or platforms or caused by emergency)⁴³ of substances within the State's territorial waters.

The parties to the London Convention recognized that effective international control over dumping activities required the ability to adapt to future developments. As a result, the Convention included prescriptions for the regular convening of consultative meetings,⁴⁴ as well as prescriptions for amending the Convention in the original agreement. The following two sections explain the provisions for amending the Convention, and the shortcomings of Convention enforcement provisions.

a. Provisions for Amending the Convention

The procedure for amending the London Convention depends on whether the amendment affects the body of the convention or one of the three annexes that list specially regulated material and the criteria to be used in issuing dumping permits. Amendments to the body of the Convention enter into force after two-thirds of the Parties have accepted the amendment⁴⁵ and are not binding on a contracting party without express acceptance.⁴⁶ Amending an annex must be based on scientific or technical considerations and must be approved by a two-thirds majority of the contracting parties present at the meeting.⁴⁷ Amendments to annexes are binding on all parties on the 100th day after approval, unless the Party expressly states that it does not accept the amendment.⁴⁸

By providing mechanisms to amend the Convention, the parties recognized the desirability of the ability to change regulations as the need arises. Allowing member states to opt out of subsequent provisions respects

⁴³ The exemption of waste incidental to operations of vessels and dumping by emergency pertains to both the discharge of radioactivity from nuclear powered vessels and the radioactive contamination resulting from submarine accidents. See generally *Facts and Problems*, *supra* note 3 (describing radioactive releases from the normal operation of submarines as well as details on several nuclear accidents).

⁴⁴ London Convention, *supra* note 2, art. XIV, § 3.

⁴⁵ London Convention, *supra* note 2, art. XV, § 2.

⁴⁶ London Convention, *supra* note 2, art. XV, § 1(a).

⁴⁷ London Convention, *supra* note 2, art. XV, § 2 (n.b. At least with respect to evaluating radioactive waste disposal, the strict requirement for considering only scientific and technical considerations was broadened to include political, legal, economic, and social factors. See Bewers & Garrett, *supra* note 32, at 124).

⁴⁸ London Convention, *supra* note 2, art. XV, § 2.

the sovereignty of each party and may result in greater membership as states will not be concerned that they will be held to future regulations with which they disagree. However, opt-out provisions also threaten the uniformity of a Convention as the possibility exists that individual member states will concurrently be subject to different regulations.⁴⁹ Indeed, this is the present situation governing the dumping of radwaste as a result of Russia's formal objection to the 1993 amendment to annex I that prohibits all ocean dumping of radioactive material.⁵⁰

Prior to the prohibition of all types of radioactive waste dumping in November 1993, "high level radioactive wastes"⁵¹ were included in annex I—"the black list"—which lists substances prohibited from ocean disposal.⁵² Dumping of all other radioactive material was subject to the requirements of annex II—"the gray list"—and required a special permit prior to ocean disposal.⁵³ The authority to issue special permits is granted to each of the contracting parties subject to criteria stated in annex III⁵⁴ and article V(2).⁵⁵

⁴⁹ See PATRICIA W. BIRNIE & ALAN E. BOLYE, *INTERNATIONAL LAW AND THE ENVIRONMENT* 14 (1992) (stating that opt out procedures in other environmental treaties undermine their effectiveness).

⁵⁰ *Declarations of Non-acceptance*, *supra* note 8.

⁵¹ The exact nature of high level radioactive wastes was not defined in the LDC but the International Atomic Energy Agency ("IAEA") defines high level waste as:

(1) irradiated reactor fuel; liquid wastes from the first solvent extraction cycle of chemical reprocessing of irradiated reactor fuel, or equivalent processes; and solidified forms of such wastes; and (2) any other waste or matter of activity concentration exceeding: (a) 5×10^{-5} TBq kg⁻¹ for alpha-emitters; (b) 2×10^{-2} TBq kg⁻¹ for beta/gamma-emitters with half lives of greater than 1 year (excluding tritium); and (c) 3 TBq kg⁻¹ for tritium and beta/gamma-emitters with half-lives of 1 year or less. The above activity concentrations shall be averaged over a gross mass not exceeding 1000 tons. . . . A Becquerel (Bq), the standard international unit of radioactivity, [is] equal to the number of radioactive disintegrations taking place in a material per second. 1 terabequerel (TBq) equals 1×10^{12} Bq or 27 curies. . . . Low level radioactive wastes [] are then defined as not being high level wastes. The above definition, based on activity concentrations, differs slightly from the U.S.'s for [high-level radioactive waste]: 'the highly radioactive material resulting from reprocessing spent nuclear fuel and containing a combination of transuranic wastes (atomic numbers greater than 92) and fission products in concentrations that require permanent isolation.

Spiller & Hayden, *supra* note 20, at 359 n. 4.

⁵² London Convention, *supra* note 2, art. IV, § 1(a). The actual listing of prohibited compounds is found in annex I. London Convention, *supra* note 2, annex I.

⁵³ London Convention, *supra* note 2, art. IV, § 1(b). The actual listing of specially controlled substances is found in annex II. London Convention, *supra* note 2, annex II.

⁵⁴ London Convention, *supra* note 2, annex III. Annex III is divided into three sections. Section A lists eight characteristics of the matter to be dumped and includes: the total amount and average composition of the matter to be dumped, the form of the material to be dumped, the chemical, biochemical, and biological properties (solubility, density, oxygen demand, presence of viruses, bacteria, parasites) of the matter, toxicity, persistence, accumulation, susceptibility to physical, chemical and biochemical changes, and the probability of detrimentally affecting the marketability of other marine resources. Section B lists several criteria for evaluating the appropriateness of the dumping site and method of deposit. Some

The adoption of resolution LC.51(16) by the contracting parties to the London Convention during the Sixteenth Consultative Meeting amended annex I and II and moved all "[r]adioactive wastes or other radioactive matter" to the black list.

b. Enforcement

Among activities that are exempted from the provisions of the London Convention are activities necessitated by emergency⁵⁶ and actions by state vessels.⁵⁷ The duty to ensure that activities comply with the London Convention is delegated to the state where the vessel is registered ("flag state"), the state where the waste was loaded ("port state"), or the state having jurisdiction over the area where the dumping occurred ("coastal state").⁵⁸ In addition, each party is required to prevent and punish conduct in contravention of the Convention.⁵⁹ Even though mandatory language is used in both of the above mentioned sections, there are no provisions for sanctions in the event a state chooses to not enforce either or both of the provisions.⁶⁰ As a result of the lack of a mechanism to enable international enforcement of a rogue party's actions, the mandatory prescriptions for ensuring compliance are ineffective.

of the included criteria are: the location of the dump site in relation to other areas, the rate of disposal, the methods of packaging and containment, if any, the initial dilution achieved, the dispersal characteristics, water characteristics (temperature, pH, salinity, stratification, oxygen indices, and productivity), the bottom characteristics, and whether an adequate scientific basis exists for assessing the consequences of the proposed dumping. Section C consists of general considerations including the practical availability of alternative land-based methods of treatment, disposal or elimination.

⁵⁵ London Convention, *supra* note 2, art. V (Article V provides that a special permit may be issued for items listed on the black list "in emergencies, posing unacceptable risk relating to human health and admitting no other feasible solution.").

⁵⁶ London Convention, *supra* note 2, art. V.

⁵⁷ London Convention, *supra* note 2, art. VII, § 4.

⁵⁸ London Convention, *supra* note 2, art. VII, § 1.

⁵⁹ London Convention, *supra* note 2, art. VII, § 2.

⁶⁰ London Convention, *supra* note 2, art. X. "In accordance with the principles of international law regarding State responsibility for damage to the environment of other States or to any other area of the environment, caused by dumping of wastes and other matter of all kinds, the Contracting Parties undertake to develop procedures for the assessment of liability and the settlement of disputes regarding dumping." *Id.* In response to this, the Parties amended the Convention in 1978 with procedures concerning dispute settlement. LDC 6(III). However, the procedures will not come into force until the sixtieth day after the date on which they are accepted by two thirds of the Contracting Parties. *Id.* art. XV(1)(a). As of 1990 only 14 of 65 states (21%) had ratified the 1978 amendment. While Japan has accepted the amendment which provides for settling disputes through arbitration or the International Court of Justice and therefore appears willing to subject its actions to third party control, Russia has not. See THE FIRST DECADE, *supra* note 32, at 133.

Because The London Convention recognizes the need to accommodate regional needs and encourages “[s]tates with a common interest in particular geographical areas to enter into appropriate agreements supplementary to this Convention,”⁶¹ parties are free to implement binding enforcement on a regional level. However, there are no regional agreements pertaining to the prevention of pollution within the Sea of Japan or providing for compulsory dispute resolution between the countries bordering the Sea of Japan. While the London Convention currently lacks effective enforcement provisions of its own, increasing international acceptance of the United Nations Convention on the Law of the Sea (“UNCLOS”) is apt to provide a mechanism for enforcing the London Convention.

2. UNCLOS

The most influential international treaty regulating the use of the world’s oceans is the third United Nations Convention on the Law of the Sea.⁶² However, UNCLOS has only been in force since November 16, 1994. Russia and Japan are both signatories to UNCLOS but neither has ratified the convention.⁶³ Some commentators associate binding effect of a treaty with states that are signatories,⁶⁴ but UNCLOS itself states that the Convention shall enter into force twelve months after the sixtieth instrument of *ratification or accession* and thirty days following each subsequent *ratification or accession* (emphasis added).⁶⁵ While it is likely that both Russia and Japan will ratify UNCLOS in the near future, the provisions of UNCLOS that expand upon customary law will not be binding on either Russia or Japan until they ratify or accede to the treaty.

The import of widespread acceptance of UNCLOS should not be underestimated. In addition to its own prescriptions, UNCLOS, in article 210.4, states that global rules, standards, and recommended practices to control pollution by dumping shall be established by competent international organizations or diplomatic conference.⁶⁶ The London Convention is a competent international organization as it was established by the United

⁶¹ London Convention, *supra* note 2, pmbl.

⁶² See Law of the Sea, *supra* note 40.

⁶³ See Law of the Sea, *supra* note 40.

⁶⁴ Canfield, *supra* note 4, at 359.

⁶⁵ Law of the Sea, *supra* note 40, art. 308.

⁶⁶ Law of the Sea, *supra* note 40, art. 210.4.

Nations and reports to the International Maritime Organization. Therefore, it is consistent with UNCLOS to incorporate the global prescriptions of the London Convention into UNCLOS.

Two interesting situations result from UNCLOS's incorporating the prescriptions of the London Convention by reference. First, states that are parties to both the London Convention and UNCLOS will be subject to the binding enforcement provisions of UNCLOS for violations of the London Convention.⁶⁷ Second, states that are only subject to UNCLOS will be legally bound by amendments to the London Convention while states that are only subject to the London Convention will continue to be able to opt out of unfavorable provisions.⁶⁸

3. Customary International Law

Customary law reflects international concern for the impacts of one state's activities on other states by limiting state sovereignty.⁶⁹ The same concerns set forth in 1972 by Stockholm Convention principles 7 and 21 were reiterated twenty years later in 1992 in the Rio Declaration on Environment and Development.⁷⁰ The Rio Declaration adds to the

⁶⁷ Law of the Sea, *supra* note 40, pt. XV. Among the dispute settlement provisions are compulsory procedures entailing binding decisions that will apply to acts in contravention of international rules and standards for the protection and preservation of the marine environment. Law of the Sea, *supra* note 40, pt. XV.

⁶⁸ Clearly, this provides incentive for all member States of UNCLOS to also join and participate in the London Convention.

⁶⁹ In 1972, the United Nations Conference on the Human Environment (Stockholm Conference) adopted a declaration on the Human Environment, which set forth a general obligation of States to preserve and protect the marine environment in the two following principles:

Principle 7: States shall take all possible steps to prevent pollution of the seas by substances that are liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea. . . .

Principle 21: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Report of the U.N. Conference on the Human Environment, Stockholm, 5-16 June 1972 (United Nations publication, Sales No. E.73.II.A.14 and corrigendum), ch. I [hereinafter STOCKHOLM DECLARATION]; THE FIRST DECADE, *supra* note 32 at 42. The relation between Principle 7 and Principle 21 result in recognizing a limit to state sovereignty which prohibits a state from conducting activities that adversely affect areas or persons outside that state's control. *Developments in the Law: International Environmental Law*, 104 HARV. L. REV. 1484, 1496 (1991) [hereinafter *Developments in the Law*].

⁷⁰ U.N. Doc. A/conf.151/26 (vol. 1), Aug. 12, 1992. Principle 1: "Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with

Stockholm convention by recognizing the technological differences between developing and developed states and by encouraging international cooperation in conserving, protecting, and restoring the Earth's ecosystem.⁷¹ While these broad prescriptions of acceptable behavior are effective as guidelines, they are sufficiently broad to allow multiple interpretations.

Resolution of disputes using customary law depends on the willingness of the disputants to agree on what is customary.⁷² Perhaps one of the most commonly accepted axioms of customary international law is that a state is liable for actions that damage another state's territory.⁷³ However, in order for liability to attach, actual damage and a causal connection between the action and resulting damage must be established with clear and convincing evidence.⁷⁴

III. RUSSIAN DUMPING OF RADIOACTIVE WASTE INTO THE SEA OF JAPAN: VIOLATION OF INTERNATIONAL LAW?

Analysis of the legality of Russia's action in dumping liquid low-level waste into the sea of Japan in 1993 requires evaluating Russia's actions with respect to the express provisions of the London Convention and the general prescriptions of customary international law. There are no

nature." Principle 2: "States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental and developmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction." Principle 7: "States shall cooperate in a spirit of global partnership to conserve, protect and restore the health and integrity of the Earth's ecosystem. In view of the different contributions to global environmental degradation, States have common but differentiated responsibilities. The developed countries acknowledge the responsibility that they bear in the international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and financial resources they command." *Id.*

⁷¹ *Id.*

⁷² MICHAEL AKEHURST, A MODERN INTRODUCTION TO INTERNATIONAL LAW, ch. 3 (1987). There are several theories on how customary law develops. The theory preferred by the Soviets is the Consensual Theory which essentially states that states choose which principles of law will apply to them. This theory avoids the problems of applying a rule that is inconsistent with the internal policies of a state that can result by declaring that customary law is the law practiced by the majority of states. *Id.* at 31.

⁷³ *Developments in the Law*, *supra* note 69, at 1496.

⁷⁴ *Developments in the Law*, *supra* note 69, at 1494. The general authority for this principle comes from the 1938 Trail Smelter arbitration. Trail Smelter (US v. Can), 3 R.I.A.A. 1938 (1941). While the Trail Smelter arbitration involved the voluntary submission of Canada and the United States, legal scholars and international acceptance have transformed what was originally a narrow statement applicable to only the United States and Canada into a broad statement of customary law. *Developments in the Law*, *supra* note 69, at 1496-1497.

regional agreements regulating activities within the Sea of Japan and it is unnecessary to evaluate Russia's actions with respect to UNCLOS, as Russia has yet to accede to that agreement.

A. *Russia's Actions with Respect to The London Convention*

The London Convention became binding on the USSR on January 29, 1976.⁷⁵ With the break-up of the Soviet Union, the Russian Federation has assumed the international responsibilities of its predecessor.⁷⁶

It is not clear whether Russia's radwaste dumping in 1993 violated the London Convention because the Convention, as written, is vague. Additionally, the ineffective enforcement provisions of the London Convention make determining the legality of Russia's action inconsequential. However, a step by step application of the Convention to the facts associated with the Sea of Japan dumping incident is instructive in illustrating several weaknesses of the London Convention.

Examining three areas of the Convention in detail illustrate major weaknesses of the London Convention. First, the sovereign immunity exemption potentially exempts the majority of the earth's radioactive wastes from the Convention.⁷⁷ Second, even if sovereign immunity does not apply, there was sufficient ambiguity in the wording of protocol for the dumping of low level radwaste to argue that Russia's actions did not violate the intent of the regulations. Lastly, the ineffective enforcement provisions of the London Convention necessitate reliance on customary law for establishing international liability.

1. *Sovereign Immunity Exemption*

The London Convention is consistent with the general trend of international conventions in exempting the actions of state owned or operated vessels and aircraft.⁷⁸ The exemption is not absolute, as States are required to adopt measures that will ensure their vessels "act in a manner consistent

⁷⁵ THE FIRST DECADE, *supra* note 32, at 132.

⁷⁶ Jason H. Eaton, *Kicking the Habit: Russia's Addiction to Nuclear Waste Dumping at Sea*, 23 DENV. J. OF INT'L L. & POL'Y 287, 296 (1995); *Facts and Problems*, *supra* note 3, § 2.2 at 20.

⁷⁷ In 1993, The Russian navy alone possessed 394 nuclear reactors which was sixty percent of the world's nuclear reactors. *Facts and Problems*, *supra* note 3, at 46.

⁷⁸ THE FIRST DECADE, *supra* note 32, at 82.

with the object and purpose of [the] Convention.”⁷⁹ The object and purpose of the Convention is stated in article I of the Convention and proclaims that:

Contracting Parties shall individually and collectively promote the effective control of all sources of pollution of the marine environment, and pledge themselves especially to take all practicable steps to prevent the pollution of the sea by the dumping of waste and other matter that is liable to create hazards to human health, to harm living resources and marine life, to damage amenities or to interfere with other legitimate uses of the sea.⁸⁰

The London Convention's prescription that charges vessels enjoying sovereign immunity with the obligation to be consistent with the object and purpose of the Convention is subject to different interpretations. The United States interprets the above requirement broadly and subjects its state vessels to the same level of regulations as private vessels.⁸¹ Russia, on the other hand, reads the provision narrowly and has recognized only the responsibility to notify the International Atomic Energy Agency (“IAEA”)⁸² of the discharges of its ships enjoying sovereign immunity.⁸³ Clearly, notifying the IAEA of dumping has no connection with the level of hazards to human health or the environment posed by the dumping. However, article I only requires that the party take all practicable steps to prevent the dumping. Thus, the inclusion of the word “practicable” in article I allows for each party to decide the extent to which it will subject its state vessels to London Convention prescriptions.

Sovereign immunity will likely apply to the 1993 dumping incident in the Sea of Japan, as the Russians complied with their interpretation of the

⁷⁹ London Convention, *supra* note 2, art. VII, § 4.

⁸⁰ London Convention, *supra* note 2, art. I.

⁸¹ The United States has codified these restrictions in the Marine Protection Research Sanctuary Act. 33 U.S.C. §§ 1402-14. The United States has not yet incorporated the Convention's ban on all radioactive waste dumping into positive law. See 33 U.S.C. § 1414; *The Ocean Radioactive Dumping Ban Act of 1994*, H.R. Rep. No. 522, 103d Cong., (May 23, 1994), available in WESTLAW, LH Database; H.B. 1154, 104th Cong., (1995), available in WESTLAW, US-BILLTRK Database.

⁸² The parties to the London Convention have delegated the responsibility to define “high level radioactive wastes unsuitable for dumping at sea, and to [provide] recommendations for issuing permits for dumping at sea” to the IAEA. *Aide-Memoire on Dumping of Liquid Radioactive Waste by The Russian Federation in The Sea of Japan*, 9 INT'L ORGANIZATIONS & THE LAW OF THE SEA, DOCUMENTARY Y.B. 753, 755 (1993) (Neth. Inst. for the Law of the Sea) [hereinafter *Aide-Memoire*].

⁸³ *Facts and Problems*, *supra* note 3, at 8.

London Convention's sovereign immunity exemption. The dumping occurred from a Russian navy vessel,⁸⁴ and the Russian's letter to the IAEA on October 5, 1993 represents the Russian view that the dumping was the only practicable option.⁸⁵ Allowing nations complete discretion to determine when sovereign immunity applies has the potential to undermine the effectiveness of the London Convention. In addition, if state action is not regulated to the same extent as private action, international control of ocean dumping of radwaste will be practically nonexistent.⁸⁶

If it is argued that Russia did not exhaust all practicable steps, then the sovereign immunity exemption will not apply to the dumping. Recognizing that the phrase "all practicable steps" is flexible, a plausible argument exists that even though the Russians characterized the dumping as an emergency situation,⁸⁷ it was "practicable" for them to follow the Convention's guidelines for emergencies.⁸⁸ The Convention requires the dumping state to supply prior notice to countries that are likely to be affected by the dumping and to comply, to the maximum extent feasible, with the recommendations of the appropriate organizations.⁸⁹ The Russians did not notify neighboring countries⁹⁰ or the International Maritime

⁸⁴ Hadfield & MacKenzie, *supra* note 27.

⁸⁵ See *Aide-Memoire*, *supra* note 82, at 754. Mr. V. I. Danilov-Danilyan, Minister of the Russian Federation Ministry of Protection of the Environment and Natural Resources sent the following letter to the Director General of the IAEA on October 5, 1993:

I wish to inform you that in view of the complex situation concerning the handling of radioactive waste from nuclear-powered submarines, which matter is treated in detail in the White Book ('Facts and Problems Related to Radioactive Waste Disposal in Seas Adjacent to the Territory of the Russian Federation') and considering the critical state of the floating storage facilities for liquid radioactive waste at the bases of the Pacific Fleet, we have of necessity authorized the disposal of liquid radioactive waste in Area No. 9 (*see* White Book) in the Sea of Japan on a once-only-basis.

Aide-Memoire, *supra* note 82, 754.

⁸⁶ See *supra* note 77 and accompanying text. The members present at the Twelfth Consultative Meeting agreed that the definition of dumping contained in article III(1)(a)(ii) and the requirement to act in a manner consistent with objectives and purposes of the convention applied "to the disposal at sea of any vessel, whether military or non-military, nuclear-powered or non-nuclear-powered, commissioned or decommissioned." THE FIRST DECADE, *supra* note 30, at 83 (In effect this eliminated the sovereign immunity exemption for disposing of state owned vessels.).

⁸⁷ *Radioactive Waste: Russian Officials Admit to Dumping 900 Cubic Meters of Waste in Sea of Japan*, 201 DAILY ENV'T REP. (BNA) d-5, Oct. 20, 1993, available in WESTLAW, BNA-ENV Database [hereinafter *Radioactive Waste*].

⁸⁸ London Convention, *supra* note 2, art. V, § 2.

⁸⁹ London Convention, *supra* note 2, art. V, § 2.

⁹⁰ See *Japan Demands End*, *supra* note 7.

Organization ("IMO") and did not wait for recommendations from the IAEA.⁹¹

Even if it is established that Russia did not take all practicable steps to avoid the dumping, in order to find that the purpose of the Convention was violated, it must further be shown that the dumping was liable to create hazards to human health or the environment or that the dumping interfered with other legitimate uses of the sea. There is neither evidence that other legitimate uses of the sea were impacted nor conclusive scientific evidence that dumping between two and three curies of radioactivity 100 kilometers from shore is hazardous to human health or living resources.⁹²

The weaknesses of the sovereign immunity exemption illustrated above have not changed with the adoption of a permanent ban on low-level radwaste disposal.

2. *Restrictions for Low-level Waste Disposal*

If sovereign immunity does not apply to the event, then Russia's actions will be subject to the prescriptions of the London Convention as it existed in October of 1993.⁹³ In October of 1993, the London Convention distinguished between high-level and low-level radioactive wastes.⁹⁴ The disposal of 900 tons of liquid radioactive waste with a radioactivity level of two micro curies per kilogram⁹⁵ is not within the definition of high-level waste⁹⁶ and is therefore considered low-level waste. At the time of the incident, low-level radwastes were subject to the restrictions of an annex II listed material. In addition, the moratorium on low-level radwaste disposal implemented by resolution LDC.21(9) was still in effect. However, this resolution was non-binding as it merely requested the contracting parties to

⁹¹ See London Convention, *supra* note 2, art. V(2); *Aide-Memoire*, *supra* note 82, at 754.

⁹² The scientific report prepared for the Ninth Consultative Meeting showed neither that dumping of low-level radwastes at sea was environmentally dangerous nor that it was harmless. THE FIRST DECADE, *supra* note 32, at 105.

⁹³ The same analysis is still valid for current Russian dumping as a result of Russia's objection to the permanent prohibition of low-level waste. However, all other Parties to the London Convention as well as Parties to UNCLOS (see *infra* Part III.A.3) are prohibited from all radwaste disposal. See *Declarations of Non-Acceptance*, *supra* note 8.

⁹⁴ As a result of Russia's objection to the permanent prohibition of low-level waste, the distinction between high-level and low-level waste is currently important only for Russia. See *Declarations of Non-Acceptance*, *supra* note 8.

⁹⁵ Kiyoshi Sakurai, *From Russia with Love: Oceans Around Japan Full of Nuclear Waste*, 62 TOKYO BUSINESS TODAY, Apr. 1994, at 36-38.

⁹⁶ London Convention, *supra* note 2, annex I, § 6. The IAEA definition of high-level radioactive waste is described in *supra* note 51.

suspend radioactive dumping and did not alter the terms of the Convention.⁹⁷

To determine if Russia properly granted a special permit pursuant to article IV, for the dumping of an annex II listed substance, it is necessary to evaluate the dumping activity with respect to IAEA guidelines. The authority to institute guidelines for low-level radwaste dumping was delegated to the IAEA.⁹⁸ Even though Russia did not comply with several of the IAEA's recommendations, a strict reading of the Convention concludes that the IAEA regulations are merely guidelines and that the only requirement is that the nation desiring to dump low-level radwaste consider the factors listed in annex III prior to issuing a special permit. After all, the Convention itself says only that the "contracting Parties *should* take full account of the recommendations of . . . the IAEA."⁹⁹

Even if the IAEA recommendations are elevated to the level of prescriptions, Russia's actions do not appear to violate the policy behind the prescriptions. The IAEA requires advance notice of radwaste dumping activities, the presence during the dumping of an observer from a competent international organization, that waste be contained in approved containers, and that the dumping occur between 50°N and 50°S latitude and in depths of at least 4,000 meters.¹⁰⁰ Russia notified the Secretariat of the IAEA of the planned dumping,¹⁰¹ and the reported disposal site was south of 50°N latitude.¹⁰² However, the Russians failed to have an observer on board, did not contain the waste in approved containers and the depth at the disposal site was less than 4,000 meters.¹⁰³ Upon further analysis, these violations appear to be technical rather than substantive violations of IAEA policy.

Even though an observer was not on board the Russian vessel, Greenpeace followed the vessel and documented the dumping on video and with Geiger counter measurements.¹⁰⁴ Members of Greenpeace may not have been what the IAEA had in mind when requiring an observer from a competent international organization but it is unlikely that an on-board

⁹⁷ THE FIRST DECADE, *supra* note 32, at 105.

⁹⁸ THE FIRST DECADE, *supra* note 32, at 72; London Convention, *supra* note 2, annex II § D

⁹⁹ London Convention, *supra* note 2, annex II § D (emphasis added).

¹⁰⁰ *Facts and Problems*, *supra* note 3, at 8 (citing *IAEA Requirements for Disposal of Radioactive Waste at Sea*, IAEA SAFETY SERIES No. 78 (Vienna, 1978)).

¹⁰¹ See *supra* note 85 and accompanying text.

¹⁰² *Facts and Problems*, *supra* note 3, tbl. A5, at 66.

¹⁰³ *Facts and Problems*, *supra* note 3, tbl. A5, at 66.

¹⁰⁴ A. Varlamov, *Russian Navy Resumes Dumping of Nuclear Waste in Sea of Japan*, BBC SUMM. OF WORLD BROADCASTS, Oct. 22, 1993, available in LEXIS, NEWS Library, BBCSWB File.

observer from a sanctioned agency would have documented the events more thoroughly.

Moreover, the assumption that radwaste disposal would be safe if the disposal location is in depths greater than 4,000 meters is flawed. While it is true that different areas of the ocean exhibit different levels of productivity and thus different levels of risk in incorporating radioactivity into the food chain, human understanding of the deep oceans remains in its infancy. Indeed the very areas that were previously thought to be ideal for disposal of radwaste due to low productivity have recently been reported to support a wide variety of life.¹⁰⁵

The most serious violation of IAEA protocol was the direct release of the radwaste into the surface waters of the ocean.¹⁰⁶ Members of Greenpeace recorded elevated levels of radioactivity at the time of dumping,¹⁰⁷ but subsequent scientific investigations have been unable to detect any damage whatsoever.¹⁰⁸ Prior to the October 17, 1993 dumping, Japan had conducted numerous studies to monitor the possible radioactive contamination of the Sea of Japan.¹⁰⁹ While none of the studies detected unusual levels of radioactivity, the conclusions were "of limited value, as none of the surveys [were] able to collect samples in the actual dumping area, which lies within Russia's 200-mile exclusive economic zone."¹¹⁰ Immediately after the October 17, 1993 dumping, Japan commissioned the research ship *Meiyo* to take measurements in the dumping zone.¹¹¹ No changes in the environment were detected.¹¹² In March 1994, a joint research expedition with government officials from Japan and scientists from Russia, South Korea, and the IAEA took seawater and seabed

¹⁰⁵ William J. Broad, *The World's Deep, Cold Sea Floors Harbor a Riotous Diversity of Life*, N.Y. TIMES, Oct. 17, 1995, at C1.

¹⁰⁶ One of the IAEA's recommendations for ocean dumping of radwaste states: "The dumping of unpackaged liquid radioactive waste into the deep sea shall be prohibited." *Aide-Memoire*, *supra* note 82, at 757.

¹⁰⁷ *Japan Demands End*, *supra* note 7.

¹⁰⁸ Vasilii Golovnin, *Japanese Research Ship Reports No Sign of Radioactivity*, BBC SUMM. OF WORLD BROADCASTS, Oct. 28, 1993, available in LEXIS, NEWS Library, BBCSWB File; *Okean Expedition Finds No Ecological Damage From Nuclear Waste Dumping*, BBC SUMM. OF WORLD BROADCASTS, Apr. 29, 1994, available in LEXIS, NEWS Library, BBCSWB File.

¹⁰⁹ David Swinbanks, *Japan to Study Damage From Russian Dumping*, 365 NATURE 777 (Oct. 28, 1993).

¹¹⁰ *Id.* According to UNCLOS, coastal states have jurisdiction over marine scientific research within their exclusive economic zone (200 miles). Law of the Sea, *supra* note 40, arts. 56(1)(b)(ii), 246(1).

¹¹¹ Golovnin, *supra* note 108.

¹¹² Golovnin, *supra* note 108.

sediment samples at seven points in the Sea of Japan.¹¹³ Levels of radioactivity at the dumping sites were found to be within normal background levels of radiation.¹¹⁴

The 1993 prohibition of low-level wastes by the London Convention eliminates the need for the IAEA dumping protocol for all parties except Russia. The IAEA restrictions continue to apply to Russian activity as a result of Russia's opting out of the Convention's 1993 prohibition of low-level radwaste. As previously explained, the Convention will not provide a mechanism for the international community to stop Russian activity if Russia should choose to continue to dump low-level radwastes. In addition to the unenforceability of the IAEA regulations, it can be argued that Russia will be consistent with the IAEA policies of documenting waste disposal and disposing of wastes in a safe manner, if Russia models future dumping activity on the procedures followed in the Sea of Japan.

3. *Enforcement Provisions*

The London Convention lacks effective provisions for international enforcement.¹¹⁵ The Convention has been unable to garner sufficient support to implement international dispute resolution provisions.¹¹⁶ Instead the Convention relies on each party to implement Article VII of the London Convention, which requires flag states, port states, and coastal states to take measures that will ensure compliance with the convention.¹¹⁷ Because the dumping activities of 1993 occurred within Russian jurisdiction¹¹⁸ by a

¹¹³ *Radioactivity Monitoring Ship Heads For Sea of Japan*, BBC SUM. OF WORLD BROADCASTS, Mar. 23, 1994, available in LEXIS, NEWS Library, BBCSWB File.

¹¹⁴ *Okean Expedition Finds No Ecological Damage From Nuclear Waste Dumping*, *supra* note 108.

¹¹⁵ See THE FIRST DECADE, *supra* note 32, at 93.

¹¹⁶ See THE FIRST DECADE, *supra* note 32, at 133.

¹¹⁷ London Convention, *supra* note 2, art. VII, § 1.

Each Contracting Party shall apply the measures required to implement the present Convention to all:

- (a) vessels and aircraft registered in its territory or flying its flag;
- (b) vessels and aircraft loading in its territory or territorial seas matter which is to be dumped;
- (c) vessels and aircraft and fixed or floating platforms under its jurisdiction believed to be engaged in dumping."

London Convention, *supra* note 2, art. VII, § 1.

¹¹⁸ The dumping occurred 90 miles south of Nakhodka. See A. Varlamov, *Russian Navy Resumes Dumping of Nuclear Waste in Sea of Japan*, BBC SUMM. OF WORLD BROADCASTS, Oct. 19, 1993, available in LEXIS, NEWS Library, BBCSWB File. *Contra* Joseph E. Schmitz & Robert F. Foxworth, *Coping with the New Russian Nuclear Threat: A Legal Alternative to Environmental Extortion*, 6 GEO.

Russian flagged vessel, which originated from a Russian port,¹¹⁹ enforcement under the Convention by countries other than Russia for the radwaste dumping in the Sea of Japan in October is not possible.

The recent prohibition of low-level wastes does nothing to affect the enforcement provisions of the London Convention. However, the ability of UNCLOS to incorporate the terms of London Convention by reference in combination with UNCLOS's provisions for binding enforcement may render the London Convention's lack of enforcement mechanisms moot.¹²⁰

B. Customary Law

Regardless of the London Convention's lack of effective enforcement provisions and its sovereign immunity exemption, Russia will not escape liability for its radioactive dumping, if harm can be causally linked to the dumping activities. Proving harm with any degree of certainty, let alone the customary law standard of clear and convincing evidence,¹²¹ is highly unlikely as surveys of the disposal site have been unable to detect any residual elevation of radioactivity.¹²² Without evidence of harm to human health or the environment, liability under customary law will not attach to the 1993 dumping of radwastes in the Sea of Japan.

C. Current Russian Position on Ocean Disposal of Radioactive Wastes and International Response.

As of January 1996, there have been no new reports of current Russian radwaste dumping. Russia vowed in February 1994 that it would "continue its endeavors to ensure that the sea is not polluted by the dumping of wastes and other matter"¹²³ but has routinely announced that it will be forced to resume dumping unless it receives international aid to develop

INT'L ENVTL. L. REV. 445 (1994) (authors incorrectly identified the location of the October 1993 Russian dumping to have occurred "ninety miles from the *Japanese* city of Nakhodka" (italics added)). Nakhodka is a Russian city located on the western shores of the Sea of Japan. NAT'L GEOGRAPHIC ATLAS OF THE WORLD 85 (6th ed. 1990).

¹¹⁹ Varlamov, *supra* note 104 (the Russian towed tender TNT-27 left the nuclear submarine base in Pavlovsk, near Vladivostok).

¹²⁰ See discussion on UNCLOS *supra* Part I.C.2.

¹²¹ See *supra* note 74 and accompanying text.

¹²² See *supra* text accompanying notes 110-12; Golovnin, *supra* note 108; Swinbanks, *supra* note 109.

¹²³ *Declarations of Non-Acceptance*, *supra* note 8 (this statement was included in the Russian objection to the prohibition of low-level radwaste dumping).

suitable land based disposal sites.¹²⁴ The precarious nature of Russia's nuclear disposal policy appears to result from a combination of military downsizing and associated decommissioning of nuclear powered vessels and nuclear weapons, a lack of adequate land storage facilities, and a lack of sufficient economic resources to fund land disposal sites.¹²⁵ Alternatively, it has been proposed that Russia may be using the possibility of continued ocean disposal of radioactive wastes as a bargaining chip to obtain international aid.¹²⁶

Regardless of the reasons for Russia's continued interest in ocean disposal of radwastes, international refusal to offer aid or impose sanctions may exacerbate the precarious nature of Russia's radioactive program and result in additional Russian radwaste dumping. International assistance will facilitate Russian storage of Russian generated radioactive wastes. Russia will therefore become accountable for its past transgressions by ensuring that the risks and hazards associated with its radioactivity be contained within Russian land instead of externalized by spreading the risk of harm over all ocean users.¹²⁷ Furthermore, article II of the Convention requires contracting parties to collectively take measures "according to their scientific, technical and economic capabilities" to prevent marine pollution caused by dumping.¹²⁸ For these reasons, the approach taken by both Japan and South Korea in offering economic and technical assistance¹²⁹ is

¹²⁴ Reports of Russia's need or intention to resume radioactive waste dumping in the sea of Japan have been continually reported since October 1993. As of November 1, 1995, a LEXIS search of the BBC Summary of World Broadcasts revealed that Russia's intent to resume dumping changed seven separate times since October 1993.

¹²⁵ See Eaton, *supra* note 76.

¹²⁶ Schmitz & Foxworth, *supra* note 118, at 445; Sakurai, *supra* note 95.

¹²⁷ See generally THE FIRST DECADE, *supra* note 32, at 105-06 (citing an IAEA report prior to the Russian disclosure that calculates the risk to individuals from past ocean dumping to peak in about 200 years at a level of less than one chance in a billion per year, and that "the aggregate exposure to the global population from long-lived components of the dumped waste imply that the total casualties resulting from past dumping may be up to about 1,000 spread over the next 10,000 years or so").

¹²⁸ London Convention, *supra* note 2, art. II.

¹²⁹ South Korea will provide Russia with a special container costing one million dollars for the disposal of low-level nuclear waste. Kyonghyang Sinmun', *South Korea to Provide Nuclear Waste Disposal Facilities to Russia*, BBC SUMM. OF WORLD BROADCASTS, Oct. 10, 1995, available in LEXIS, NEWS Library, BBCSWB File. Japan has pledged 100 million dollars to help Russia dispose of nuclear wastes. Sergei Agafonov, *Experts Discuss Problem of Nuclear Dumping in Sea of Japan*, THE CURRENT DIG. OF THE POST-SOVIET PRESS, June 9, 1993, at 16. Japan's concern and willingness to assist Russia in developing suitable land based disposal facilities is commendable. Yet, Japan's motivations are not entirely altruistic. The successful transfer of Russian radwaste ocean disposal to permanent, safe Russian land based facilities will reduce the risk of harm caused by bioaccumulation of radioactivity in the Sea of Japan. In addition, the Japanese government may be able to shift national attention away from Japan's land

consistent with the prescriptions of the London Convention and preferable to either no action or a hard line stance against assisting a nation to comply with international standards.

IV. PROBLEMS WITH AN ACTIVITY AND ECOSYSTEM LIMITED APPROACH TO ENVIRONMENTAL REGULATION

A. *Problems In General*

The goal of the London Convention in regulating and reducing pollution by dumping is laudable, yet truly effective management of the ocean ecosystem will not result from isolated regulations.¹³⁰ Ocean dumping is estimated to contribute only ten percent of ocean pollution.¹³¹ Of that ten percent, radioactive wastes have routinely been ranked by the United States Council on Environmental Quality as having the least deleterious impact of all dumped material on the marine environment.¹³² While it is true that protecting the environment requires regulating small as well as large polluting activities, the strict prohibition of an activity that poses relatively small risks may be shortsighted.

On its face, the complete prohibition of ocean dumping of radioactive waste seems consistent with the London Convention's goal of preventing marine pollution. However, even total compliance with a prohibition on ocean dumping of radioactive waste will not alleviate the threat of radioactive contamination of the oceans as radioactive material enters the ocean environment from a variety of sources.¹³³ In addition, an activity specific

based radwaste pollution of the Sea of Japan that emanates from nuclear power facilities. See Sakurai, *supra* note 95.

¹³⁰ The London Convention recognizes the need to control all sources of pollution of the marine environment in article I, but restricts its regulations to dumping. See London Convention, *supra* note 2, art. I.

¹³¹ THE FIRST DECADE, *supra* note 32, at 44. The sources of pollution in decreasing order are: land-based sources (44%), atmosphere (33%), maritime transportation (12%), dumping at sea (10%), and offshore production (1%). THE FIRST DECADE, *supra* note 32, at 44 (citing *The State of the Marine Environment*, The United Nations Joint Group of Experts on the Scientific Aspects of Marine Pollution ("GESAMP") Rep. Stud. 39 (1990)).

¹³² Kindt, *supra* note 5, at 336-37. In 1970 and 1980 the U.S. Council on Environmental Quality ("CEQ") identified seven sources of ocean dumping. In decreasing order of their deleterious impact on the marine environment are: dredge spoils, industrial wastes, sewage sludge, construction and demolition debris, solid waste, explosives and chemical munitions, and radioactive wastes. Kindt, *supra* note 5, at 336-37.

¹³³ "Dumping does not include: (1) the disposal at sea of wastes or other matter incidental to, or derived from the normal operations of vessels, aircraft, platforms or other man-made structures at sea and their equipment" London Convention, *supra* note 2, art. III(1)(b). In addition to dumping,

approach to regulating the disposal of wastes merely shifts the risks that were previously associated with ocean dumping to another activity or to a different ecosystem.

Prohibiting ocean dumping does nothing to reduce the amount of hazardous material requiring disposal. In fact, it is quite possible that radioactivity banned from direct dumping into the ocean will nevertheless find its way to the sea via land based runoff or atmospheric fallout. For example, even though Japan has not reported dumping radioactive waste into the oceans since 1969,¹³⁴ the effluent from Japan's land based nuclear power plants annually contributes 13,000 curies of radioactivity to coastal waters.¹³⁵ This radioactivity flows directly into the sea but does not fall under the auspices of the London Convention as land based sources of pollution are not covered in the Convention's definition of dumping.¹³⁶ It makes neither scientific nor political sense to prohibit the disposal of radioactive wastes hundreds of miles off shore where biological productivity is relatively low, but to permit the discharge of radioactivity in coastal areas where biological productivity is relatively high.

Another consequence of prohibiting direct disposal of radioactivity in the oceans without reducing the amount of radioactive material generated is

radioactivity is present in the oceans from naturally present radioactivity, atmospheric fallout, and runoff from land based operations.

The total amount of radioactivity dumped in the ocean, some 6×10^4 TBq [this number triples with the recent disclosure of Russian radioactive waste dumping, but remains dwarfed by other sources of radioactivity], is much less than the approximately 2×10^8 TBq that were added to the oceans as a result of the atmospheric testing of nuclear weapons between 1954 and 1962. This in turn, is only 1% of the 2×10^{10} TBq that exists naturally in the ocean. [One TBq (tera bequerel) = 10^{12} Bq, where 1 Bq arises from one nuclear disintegration per second.] However, the mix of radioisotopes involved is different in each case and radioisotopes vary widely in the extent to which they can affect marine organisms and man, so that the total radioactivity is only a very rough guide to the risk. It must also be stated that the dumping cannot be considered safe just because the releases of radionuclides are small compared to the natural incidence of radionuclides in the environment.

Bewers & Garrett, *supra* note 33, at 105-06.

¹³⁴ *Facts and Problems, supra* note 3, at 14 (citing data from *Inventory of Radioactive Material Entering the Marine Environment: Sea Disposal of Radioactive Waste*, IAEA Tec. Doc. 588 (Mar. 1991)).

¹³⁵ Sakurai, *supra* note 95. "The Tokyo Electric Power Company alone is allowed to discharge 390 billion becquerels of radioactivity a year from plants bordering the Sea of Japan. The Russians were quick to point out that this is 10 times the amount dumped from their ship." Hadfield & MacKenzie, *supra* note 27, at 6. Russia's Deputy Ecology Minister Nikolai Rybalsky reported that the amount dumped totaled two to three curies. *Radioactive Waste, supra* note 86. One curie is equal to about 37 billion becquerels. See *Boehmer-Christiansen, supra* note 22, at 121 tbl. 1.

¹³⁶ London Convention, *supra* note 2, art. III. Dumping is defined as "any deliberate disposal at sea of wastes." London Convention, *supra* note 2, art. III, § 1(a)(i). The word "sea" is defined as "all marine waters other than the internal waters of States." London Convention, *supra* note 2, art. III, § 3.

that the risk of harm is at least initially transferred to another ecosystem. An ecosystem-specific view to regulating activities as implemented in the London Convention does not attempt to determine where the lowest level of risk exists but rather considers only the direct effects of permitting or prohibiting an activity on the subject ecosystem.¹³⁷

The ease of regulating any given activity or ecosystem is independent of the risk associated with that activity. Within any ecosystem, discrete activities, such as dumping, will be the first to be regulated because their limited nature facilitates human intervention. In addition, nation states are more likely to agree to regulating shared resources, such as the ocean, than they are to agree to relinquish sovereign control over national territory. As a result, the activities first regulated will not necessarily be those that pose the greatest threat to human health or the environment but will consist of discrete activities conducted with shared resources. The recent prohibition of ocean dumping of radioactive wastes exemplifies this theory as radioactive wastes are considered by the U.S. Council on Environmental Quality to pose less of a threat to the marine environment than dredge spoils, industrial wastes, sewage sludge, construction and demolition debris, solid waste, explosives, and chemical munitions.¹³⁸ And dumping accounts for only ten percent of all marine pollution.¹³⁹

B. Problems with the Precautionary Approach

The precautionary approach is sound in theory but should not be applied to all environmental regulations without prior analysis of the prohibition's global impact. The use of precautionary principles in environmental regulations condones restricting activities without requiring a causal link to harm.¹⁴⁰ The precautionary approach can be both environmentally and economically advantageous as human knowledge of the environmental impacts of an activity are often incomplete, and "it is

¹³⁷ Prior to the prohibition of low-level wastes, evaluating the practical availability of alternative land-based methods was encouraged. See *THE FIRST DECADE*, *supra* note 32, at 152-53; *Amendments to the Guidelines for the Application of Annex III*, LONDON CONVENTION RESOLUTION LDC.32(11) (1989).

¹³⁸ Kindt, *supra* note 5, at 336-37.

¹³⁹ *THE FIRST DECADE*, *supra* note 32, at 44.

¹⁴⁰ The precautionary principle in general shifts the burden from the traditional common law approach of allowing an activity unless and until a causal connection between the activity and harm can be shown and places the burden on the proponent of the action to show that the activity will not cause harm. See Fullem, *supra* note 1. See *Amendments*, *supra* note 2. London Convention resolution LC.44(14) adopted the principle of precautionary action as recommended by the Governing Council of the United Nations in decision 15/27 of 25 May 1989. LDC.44(14), *supra* note 36.

generally preferable to prevent pollution than to deal with pollution after it has occurred."¹⁴¹ In the precautionary approach the proponent of an activity generally has the burden of showing that the activity is safe.

The ease in which the precautionary approach enables activities to be prohibited is both a strength and a weakness. The strength is that activities are prevented before they harm an environment. The weakness is that a wide range of activities in an entire ecosystem can be prohibited without considering the impacts on other environments. The ability to close off entire ecosystems without regard for the effects of the closure on other ecosystems runs the risk of creating greater environmental harm.

After all, with hazardous material that has already been generated, the questions are what is the safest method of disposal and where is the safest location for disposal, not whether disposal is necessary. Indeed, the parties to the London Convention, by prohibiting ocean disposal of low-level radwastes, eliminated disposal across seventy-one percent of the earth's surface¹⁴² with apparent disregard for the risks presently associated with land disposal.

While completely accurate global analysis of the risks associated with many hazardous activities is beyond human capability, simplistic activity specific evaluations do not attempt to minimize the risk to human health or the environment. It is quite possible that at least some types of radwaste disposal will pose less of a risk in a particular area of the ocean than they will on land. It is for this reason that the parties to the London Convention should re-evaluate their implementation of the precautionary approach and keep all options for radwaste disposal open until a truly permanent and safe disposal method is developed.

V. CONCLUSION

The London Convention's strength comes not from enforcement but from voluntary compliance. The London Convention is a flexible document that lacks teeth for enforcing voluntarily agreed to provisions. It allows states to completely withdraw from the Convention or to opt out of specific amendments. The opt-out provisions are evidence of the continuing importance that states place on sovereignty as well as the desire of the contracting

¹⁴¹ James E. Hickey & Vern R. Walker, *Refining the Precautionary Principle in International Environmental Law*, 14 VA. ENVTL. L.J. 423, 423 (1995).

¹⁴² Kindt, *supra* note 5, at 335.

parties to promote honesty. Since a state will not be bound to prescriptions that it opts out of, there is incentive for a state to honestly represent its intent.

However, the lack of effective enforcement provisions counters the incentive for honesty. An honest state will be subjected to international pressure to conform, while a dishonest state will avoid the international pressure to conform and will escape international liability for its actions unless they are shown to cause harm to another state's resources. Of course, the violating state will be subject to international condemnation if and when its violations are discovered, but, as the Russians and Soviets before them have shown, nation states may be willing to risk future embarrassment or sanctions for the appearance of present conformity.

Notwithstanding the ability to cheat, voluntary compliance with the provisions of the London Convention remains high. The current setback regarding Russian noncompliance with the prohibition on dumping radioactive waste may be just a blip along the path to total abstinence from using the oceans as a radioactive dump. In fact, provisions for effective international enforcement of the London Convention's provisions may finally be a reality. If the London Convention is accepted by UNCLOS as a competent international organization, the mechanisms for binding enforcement within UNCLOS will apply to the London Convention's regulations.

The near universal acceptance of a total prohibition on ocean disposal of radwaste illustrates the potential danger of adopting a precautionary approach for a single activity in a single ecosystem. Now that seventy-one percent of the earth's surface has been declared off limits as a disposal site for radwastes, terrestrial sites must be found regardless of the risks to human health or the environment.

While it is true that protecting the oceans from becoming a global dump prevents nations from externalizing the risks associated with hazardous activities, the ultimate goal should be to minimize the global risks to human health and the environment. If indeed, it is determined that a particular portion of the ocean is the safest location for a specific type of disposal, the fact that the ocean is a shared resource should not prevent its utilization. Instead, international mechanisms should be established to regulate and protect the global environment. For example, imposing fees for using shared resources could be tied to the risks associated with an activity. These fees could then be used for monitoring and mitigating

adverse impacts as well as for research and development of safer disposal techniques.

The sanctity that states place on sovereignty is presently an insurmountable hurdle to effective and comprehensive global regulation of activities with environmental impacts. States are unlikely to relinquish total control of their domestic activities to international organizations. However, the parties to the London Convention should seek to minimize environmental harm caused by ocean dumping by altering their implementation of the precautionary approach to consider the global impact of their ecosystem specific regulations.

