

Environmental Law and Nuclear Law: A Growing Symbiosis

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International nuclear law has developed over the last 50 years and during most of its history its main focus has been on protecting people and property. Protection of the environment has only made an occasional appearance, and the international conventions on nuclear third party liability amply illustrate this point. Under the Paris Convention on Third Party Liability in the Field of Nuclear Energy (1960) and the Vienna Convention on Civil Liability for Nuclear Damage (1963) the notion of nuclear damage is understood to cover personal injury and property damage causally related to a nuclear incident. The conventions do not refer to environmental damage at all.

However, that does not necessarily mean that such damage is not compensable under the conventions. Both instruments leave it to the competent national court to decide upon what constitutes *property damage*. This is done intentionally, given the wide divergence of tort law principles and jurisprudence in those countries which are parties to these conventions. Some countries have adopted a sufficiently broad interpretation of *property damage* so as to include environmental damage; others have not. The Vienna Convention even envisages a second possibility for covering environmental damage under the heading “any other loss or damage so arising or resulting if and to the extent that the law of the competent court so provides”.¹ Damage to the environment may thus be compensated under the Vienna Convention if the applicable national law so provides.

This article is divided into two parts. The first part deals with the interrelationship between environmental law and nuclear law. It specifically addresses selective topics which the author considers as substantial proof that environmental law is in evidence in the nuclear field. These topics are access to nuclear information, public participation in nuclear decision making and

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1. Article I(1)(k) of the Vienna Convention on Civil Liability for Nuclear Damage (1963).

prevention and compensation of environmental damage caused by nuclear incidents. Environmental law will be considered in its narrow sense, meaning the law that seeks to protect nature (the ecosystem or the natural environment) such as soil, water, air and biodiversity. The position of the author is that the importance of environmental law for nuclear activities is increasing and may lead to a growing symbiosis with nuclear law. Environmental law and nuclear law share the same objectives: protection against, mitigation of, and compensation for damage to the environment.

In the second part a specific problem that touches upon the extraterritorial effect of environmental legislation in the nuclear field will be examined. At the beginning of the 21st century, it can be expected that vendors of nuclear facilities will spare no efforts in trying to enter new markets all over the world. Countries with more developed environmental legislation may be tempted to impose their own stricter environmental requirements on the construction of nuclear facilities by their national vendors in customer countries. This part of the article will analyse whether public international law permits national legislatures to apply and enforce their environmental laws to the construction of nuclear facilities abroad. The author believes that there may well be a legal basis under customary international law justifying the application of national environmental law to the construction of nuclear facilities and the performance of work on nuclear facilities in foreign countries, but there would appear to be none permitting the enforcement of these laws in the absence of an agreement with the foreign country.

1. Environmental law governing the nuclear field

1.1 Introduction

Protection of the environment was not a major concern for the original drafters of the international nuclear law conventions but this has changed over time. Public awareness of the harmful effects of certain industrial activities (such as chemicals and asbestos) in the 1970s and 1980s led to an increasing concern for protecting the environment which impacted the nuclear field as well. Following the catastrophic accident at the Chernobyl nuclear power plant in 1986, many governments recognised that they needed to better protect the environment. Environmental law was the right instrument to help them achieve that goal and it now applies to the nuclear field in two different ways, one direct and the other indirect. It does so directly by making nuclear activities subject to international environmental law; it does so indirectly by introducing the concept of environmental protection into international nuclear law.

Environmental law made its *indirect* appearance in the nuclear field through the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986). That convention provides that contracting parties shall protect not only life and property, but also the environment from the effects of radioactive releases.² Other specific international nuclear law instruments followed this example and turned the protection of the environment into one of their principal objectives. Such was the case with the Convention on Nuclear Safety (1994)³ and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste

2. Article 1 of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986).

3. Article 1 of the Convention on Nuclear Safety (1994).

Management (1997).⁴ The Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage (1997), the Convention on Supplementary Compensation for Nuclear Damage (1997) and the Protocol to Amend the Paris Convention on Nuclear Third Party Liability (2004) (“the revised and new nuclear liability conventions”) all hold nuclear operators liable for the cost of measures of reinstating a significantly impaired environment or for economic loss arising from an economic interest in the use or enjoyment of the environment that has been significantly impaired due to a nuclear incident.⁵

Environmental law also *directly* applies to nuclear activities, albeit not very consistently. Environmental legislation naturally tends to cover all activities that may cause environmental damage, and there is no doubt that nuclear activities may cause such damage. Yet only some international environmental law conventions apply to nuclear activities while others do not.

The London Convention on the Prevention of Marine Pollution by Dumping of Waste and other Matter (1972) is an example of an international environmental law convention which prohibits any release of high-level radioactive wastes in the sea. Other examples of international environmental law conventions that apply to the nuclear field include the Convention for the Prevention of Marine Pollution from Land-Based Sources (1974) which obliges contracting parties to adopt measures to forestall and eliminate pollution of the maritime area by radioactive substances from land-based sources,⁶ the Espoo Convention on Environmental Impact Assessment in a Trans-boundary Context (1991) (“Espoo Convention”) which requires environmental impact assessments for nuclear energy projects and the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (1998) (“Aarhus Convention”) which obliges public authorities, *inter alia*, to give the public access to certain types of nuclear information.

However, other international or regional environmental law instruments exclude nuclear activities from their application because such activities are already effectively governed by specific legislation or by other international conventions. The EU Environmental Liability Directive (2004)⁷ illustrates this point. The directive does not apply to environmental damage or to any imminent threat of such damage arising from a nuclear incident in respect of which liability or compensation falls within the scope of any of the international nuclear liability conventions, including any future amendments thereof, which is in force in the member state concerned.⁸ The

4. Article 1 of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997).

5. See the definitions of nuclear damage in Article 1 of the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage, the Convention on Supplementary Compensation for Nuclear Damage and the 2004 Protocol to Amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy. For more information on the notion of “environmental damage”, see Chapter 1.4 of this article.

6. The Convention for the Prevention of Marine Pollution from Land-Based Sources (1974) was later replaced by the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic (1992).

7. Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with regard to the Prevention and Remedying of Environmental Damage (*OJ L 143, 30.4.2004, p. 56*).

8. The Environmental Liability Directive does provide however that this exclusion may be amended on a proposal from the European Commission to the European Parliament and the Council of Ministers

Convention on Liability and Compensation of Damage in connection with the Carriage of Hazardous and Noxious Substances by Sea (1996) (“HNS Convention”), the Convention on Civil Liability for Damage caused during Carriage of Dangerous Goods by Road, Rail and Inland Navigation Vessels (1989) (“CRTD Convention”) and the Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment (1993)⁹ are additional examples of this approach.

1.2 Public access to nuclear information

Laws providing for the public’s right of access to information and participation in decision-making processes were almost non-existent in the early days of nuclear energy development and production. Most governments did not see the need to inform the public of its potential risks or invite public participation in nuclear policy or project decisions.¹⁰ The concepts of transparency of information and stakeholder involvement came to the field of nuclear energy through environmental legislation. In fact, environmental law supported and accelerated a general breakthrough in public information and participation rights in many other fields of law, including nuclear law.¹¹

At the international level, the United Nations Stockholm Declaration on the Human Environment (1972) and later its Rio Declaration on Environment and Development (1992) served as driving forces for the adoption of international and national legal instruments on access to information and public participation in decision making.¹² Legal instruments were seen as the appropriate means of guaranteeing debate on proposed projects by all stakeholders, thereby aiming to ensure that potentially adverse environmental consequences were either prevented or acceptably mitigated. At bilateral level, a number of agreements were concluded, particularly in Europe, which grant citizens of neighbouring states certain rights of participation in national licensing procedures.¹³

before 30 April 2014 on the basis of a review of the coverage by the international nuclear liability conventions (see Article 18).

9. The Lugano Convention has not yet entered into force.
10. In some states, legal provisions on public participation in nuclear decision-making *did* exist at an early stage. See, for example, the National Environmental Policy Act of 1969 (“NEPA”) in the United States.
11. Reflections on 30 Years of EU Environmental Law, Ed. Prof. Macrory, R., *Europa Law Publishing*, 2005, p. 64. See also Ebersson, J., “The Notion of Public Participation in International Environmental Law”, *Yearbook of International Environmental Law*, 1997, vol. 8, p. 51.
12. Principle 1 of the Stockholm Declaration states: “Man has the fundamental right to...an environment of a quality that permits a life of dignity and well-being, and he bears a solemn responsibility to protect and improve the environment for present and future generations (...)”. Principle 10 of the Rio Declaration states: “Environmental issues are best handled with participation of all concerned citizens (...). At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities ... and the opportunity to participate in decision-making processes (...). Effective access to judicial and administrative proceedings ... shall be provided”.
13. For example, Agreement between Germany and Switzerland for the Reciprocal Provision of Information concerning the Construction and Operation of Nuclear Installations in Frontier Areas of 10 August 1982, available at http://untreaty.un.org/unts/60001_120000/12/37/00023841.pdf.

However, it was only in 1997 that a binding international legal instrument addressing the public's right to access information and to be consulted was adopted specifically for the nuclear field. The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997) ("Joint Convention") makes informing the public about the safety of spent nuclear fuel and radioactive waste management facilities mandatory. Contracting parties must not only make such information available to the public but they must consult with, and provide general data to other contracting parties in the vicinity of a facility, insofar as they are likely to be affected by it.¹⁴

The Aarhus Convention (1998) is another important international environmental law instrument that stresses the value of access to nuclear information. It grants the public¹⁵ three rights: the right to environmental information from public authorities; the right to participate in environmental decision-making by public authorities; and the right to judicial redress when the two previous rights or national environmental law has been violated. The Aarhus Convention recognises that the public must have access to "environmental information" in order to assert its right to protect the environment for present and future generations.¹⁶

Requests for information on nuclear projects are often covered by the Aarhus Convention simply because such information may be classified as "environmental". Requests may range from a simple inquiry on radiation levels in the neighbourhood of a nuclear power plant to a demand for detailed information on the safety features of a new radioactive waste storage or disposal facility. Generally speaking, any environmental information held by a public authority must be provided when requested by a member of the public unless it falls under an exempt category or if disclosure would adversely affect public security.¹⁷ Access rights are not limited to citizens of the state party; they apply equally to non-citizens and non-residents. The convention also provides that in the event of an imminent threat to human health or the environment, all information held by a public authority which would enable the public to take preventive or mitigation measures against harm from such a threat must be disseminated.¹⁸

14. Articles 6 and 13 of the Joint Convention.

15. The public is defined as natural or legal persons, and in accordance with national law or practice, their associations, organisations or groups. These three rights are set out in Articles 4 to 9 of the Aarhus Convention.

16. The Aarhus Convention defines "environmental information" as any information in written, visual, oral, electronic or any other material form on:

(a) The state of elements of the environment, such as air and atmosphere, water, soil, land, landscape and natural sites, biological diversity and its components, including genetically modified organisms, and the interaction among these elements;

(b) Factors, such as substances, energy, noise and radiation, and activities or measures, including administrative measures, environmental agreements, policies, legislation, plans and programmes, affecting or likely to affect the elements of the environment within the scope of subparagraph (a) above, and cost-benefit and other economic analyses and assumptions used in environmental decision-making;

(c) The state of human health and safety, conditions of human life, cultural sites and built structures, inasmuch as they are or may be affected by the state of the elements of the environment or, through these elements, by the factors, activities or measures referred to in subparagraph (b) above.

17. Articles 4(3) and 4(4) of the Aarhus Convention.

18. Article 5 of the Aarhus Convention.

1.3 Public participation in nuclear decision-making

Consultation with the public is considered to be a critical step whenever decisions are taken on nuclear energy projects requiring permits or licences. Public participation helps considerably to build public trust and confidence in the decision-making process which in turn reduces the risk of “decision deadlock” on the basis of “not-in-my-backyard” (NIMBY) syndromes. Participating in nuclear decision making may range from attending public hearings to participating in preliminary studies on nuclear energy projects.¹⁹ The *public* may refer to the general public but also to environmental experts or environmental interest groups.

The Espoo Convention (1991) is the primary international environmental law instrument addressing public participation. Contracting parties must ensure that environmental impact assessments (EIA)²⁰ are undertaken with public participation before authorising proposed activities that are likely to cause a significant adverse transboundary impact. An EIA is a procedure that ensures that the environmental implications of decisions are taken into account before the decisions are made. The process involves an analysis of the likely effects on the environment of a project, recording those effects in a report, undertaking a public consultation exercise on the report, taking due account of the comments and the report when making the final decision and informing the public about that decision afterwards.²¹ They are used increasingly as the primary tool for stakeholder involvement in the nuclear energy field and they have become an essential instrument in preventing undesirable environmental effects that could arise from the implementation of a nuclear project. In principle, an EIA will focus mostly on physical impacts on the environment, but it is also used as a vehicle for identifying and addressing societal concerns such as the safety of nuclear installations. Each contracting party to the Espoo Convention likely to be affected by a proposed project must be notified of it and is entitled to enter into consultations with the party of origin²² concerning, *inter alia*, the potential adverse transboundary environmental impact of the proposed activity and measures to reduce or eliminate that impact. Members of the public in the areas likely to be affected by the proposed project must also be given the opportunity to participate in relevant EIA procedures that is equivalent to that provided to the public of the party of origin.

The Chernobyl disaster in 1986 left no doubt that nuclear accidents can have a major transboundary impact and it is not surprising, therefore, that the Espoo Convention applies to all major nuclear facilities and activities: nuclear power stations and other nuclear reactors²³ and

19. For an overview of different forms of public participation in the nuclear field in Canada, see Berger, S., “Environmental Law Developments in Nuclear Energy”, *Nuclear Law Bulletin* No. 81, p. 59. For an overview of the various meanings given to “public participation” by national legislatures, see the Topical Report of the Working Group on Radioactive Waste Management in *Proceedings of the Nuclear Inter Jura Congress Brussels, 2007*. For an overview of different forms of public participation in licensing procedures in a few European countries, see Pelzer, N. and Bischof, W., “Comparative Review of Public Participation in Nuclear Licensing Procedures in Certain European Countries”, *Nuclear Law Bulletin* No. 19, p. 53.

20. United States: environmental impact statement (EIS).

21. The Espoo Convention provides no guidance on what is meant by “taking due account of the comments of the public”, an omission which could lead to conflicts in its future implementation.

22. “Party of origin” means the contracting party or parties to the Espoo Convention under whose jurisdiction a proposed activity is envisaged to take place.

²³ Except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load.

installations solely designed for the production or enrichment of nuclear fuel, for the reprocessing of irradiated nuclear fuel or for the storage, disposal and processing of radioactive waste. The Nuclear Safety Convention as well as the Joint Convention also contain provisions on consultation with respect to the impact of proposed nuclear installations, but their scope is not as wide as that of the Espoo Convention. The former basically applies only to civil nuclear power plants in operation while the latter is restricted to spent fuel management facilities and radioactive waste management facilities.

The obligations of the Espoo Convention also reach much further than those found in specific international nuclear law instruments. The Nuclear Safety Convention does not stipulate that information regarding the safety of nuclear facilities must be made available to the public; the Joint Convention does, but that obligation does not go as far as giving the public the right to participate in the nuclear decision-making process.²⁴ Both the Nuclear Safety Convention and the Joint Convention contain an obligation to consult, but this only benefits those other contracting parties in the vicinity of a proposed installation insofar as they are likely to be affected by it; consultation with the public is left to the discretion of the affected contracting parties.²⁵ Also despite their containing an obligation to do an environmental assessment appropriate to the hazard presented by the nuclear facility, neither the Nuclear Safety Convention nor the Joint Convention mentions any public involvement in that assessment.²⁶

Moreover, the Joint Convention seems to be less strict than the Espoo Convention as to the point in time when the environmental assessment must be conducted, at least in those countries where the construction of a nuclear facility is subject to a decision from a competent authority. The Joint Convention stipulates that the environmental assessment must be carried out “before construction” of a radioactive waste management facility or spent nuclear fuel management facility.²⁷ The Espoo Convention requires that such assessment take place “prior to the decision” of the competent public authority permitting the activity to take place.²⁸ The weaker provisions of the Nuclear Safety Convention and the Joint Convention are indeed surprising if we take into account that they were adopted respectively three and six years *after* the Espoo Convention.

The Aarhus Convention (1998) also contains provisions on public participation in decision making. It grants the public concerned the right to participate in environmental decision making on a wide range of activities including the construction, operation and decommissioning of nuclear power plants, reprocessing facilities, enrichment facilities, radioactive waste storage and final disposal facilities.²⁹ This right also applies to any change of the operating conditions of the facility, such as the refurbishment of reactors. Unlike the Espoo Convention, the Aarhus Convention does not specifically address transboundary impacts but where a proposed activity could affect a neighbouring country, members of the public in that country may participate in the decision-making process.

24. Paragraph iv. of the preamble as well as Articles 6(1)(iii) and 13(1)(iii) of the Joint Convention.

25. Article 17 of the Nuclear Safety Convention and Articles 6 and 13 of the Joint Convention.

26. Article 17 of the Nuclear Safety Convention and Articles 6, 8, 13 and 15 of the Joint Convention.

27. Articles 8(i) and 15(i) of the Joint Convention.

28. Articles 1(v) and 2.3 of the Espoo Convention.

29. Under the Aarhus Convention, the “public concerned” means the public affected or likely to be affected by, or having an interest in, the environmental decision making. Non-governmental organisations promoting environmental protection and meeting national law requirements are deemed to have such an interest.

Legislation on public participation in nuclear decision-making tends to focus on the project level. However, in many countries there is now a tendency to get the public involved at an even earlier stage in the decision-making process. This is true, in particular, in the development of new policies, laws and regulations, as illustrated when Greenpeace obtained a High Court ruling against the British government's consultation process regarding its nuclear power policy. A 2003 Energy White Paper issued by the government had noted that before any decision was taken to build more nuclear power stations there would be the fullest public consultation. In 2006, the government decided in a report that "nuclear has a role to play in the future UK generating mix". Greenpeace argued in court that the government had failed to live up to its promise and denied their legitimate expectation that there would be such proper consultation before making its decision to support new nuclear build. The High Court agreed and granted an order quashing the government's decision.³⁰

The Kiev Protocol is also a good example of countries' concerns with an "early consultation" procedure. In 2003, the Espoo Convention was supplemented by the Protocol on Strategic Environmental Assessment ("Kiev Protocol" or "SEA Protocol") which will, once it enters into force, require its state parties to evaluate the consequences of their "plans and programmes" that are likely to have significant environmental effects in a broad range of sectors, including nuclear.³¹ Strategic environmental assessments (SEA) occur at an earlier stage of the decision-making process than EIA's but the distinction with the latter is not always very clear. The basic idea is that a SEA shall be carried out for plans and programmes which set the framework for future development consent for specific projects subject to EIA's and that may have an impact on the environment. By way of example, a SEA will apply to a national radioactive waste management plan and would probably have to cover all strategies that may impact the environment: reprocessing or not, release *versus* containment, direct disposal or extended storage and transmutation, reversible or final geologic storage etc. An EIA will apply to each specific radioactive waste management project that is launched on the basis of the plan.³²

Under the Kiev Protocol, parties planning to develop a nuclear programme shall ensure all relevant stakeholders are consulted; that means consulting the public, national, regional and local environmental and health authorities, and other contracting parties likely to be affected by the transboundary impacts of the plan. The Kiev Protocol requires public participation at a very early stage in the decision-making process as this is when all options are still open.³³ Governments must therefore make draft plans or programmes and accompanying strategic environmental assessment reports available to the public in order to give the latter an opportunity to express its views within a reasonable time, take those views duly into account and inform the public of the decision and of the reasons therefor.

30. For a description of the case, see Salter, I., "The Queen on the application of Greenpeace Ltd. v. Secretary of State of Trade and Industry" in *Proceedings of the Nuclear Inter Jura Congress Brussels, 2007*.

31. According to Article 2.5 of the SEA Protocol, the plans and programmes must be required by legislative, regulatory or administrative provisions and subject to preparation and/or adoption by an authority or prepared by an authority for adoption, through a formal procedure, by a parliament or a government.

32. For a more detailed analysis of the impact of EIAs and SEAs on the nuclear field, see the Topical Report of the Working Group on Radioactive Waste Management in *Proceedings of the Nuclear Inter Jura Congress Brussels, 2007*.

33. See Article 8 of the Kiev Protocol.

1.4 Prevention of environmental damage caused by nuclear incidents

Today, the primary objective of nuclear law is “to provide a legal framework for conducting activities related to nuclear energy and ionizing radiation in a manner which adequately protects individuals, property and the environment”.³⁴ Nuclear law thus aims to prevent the occurrence of damage as a result of nuclear activities. However, as mentioned in the introduction to this article, for a long time states took the position that *nuclear damage* only meant personal injury and property damage. It was not until after the 1986 Chernobyl accident that they agreed to formally extend this narrow definition to cover the harmful effects of ionizing radiation on the environment as well.

The first line of defence against environmental damage is, of course, the prevention of nuclear accidents by continual reinforcement of nuclear safety programmes. The goal of the Nuclear Safety Convention (1994) is to ensure effective defences in nuclear plants against potential radiological hazards so as to protect individuals, society and the environment from the harmful effects of ionizing radiation. The Joint Convention (1997) also aims to ensure effective defences against such hazards during spent fuel and radioactive waste management activities and with the same objectives, both now and in the future. These same objectives also form the basis of the International Atomic Energy Agency’s (IAEA) Code of Conduct on the Safety and Security of Radioactive Sources (2004) and of its Code of Conduct on the Safety of Research Reactors (2004).

The second line of defence against environmental damage is effective damage mitigation through continual improvement of emergency response performance. The Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986) is intended to facilitate prompt assistance in the event of a nuclear accident or radiological emergency in order to minimise consequences and to protect not only life and property, but also the environment, from the effects of radioactive releases.

Holding nuclear operators liable for the costs of measures to prevent or reduce environmental damage may be considered the third line of defence. In many legal systems the amount of compensation awarded for damage resulting from a tort will be reduced if the claimant has failed to take reasonable measures to avoid or mitigate that damage. It therefore seemed appropriate to the negotiators of the revised and new international nuclear liability conventions that those instruments contain provisions ensuring compensation be paid for the costs of preventive measures such as, for example, costs incurred by a government to remove nuclear substances from a ship that has sunk along its coastline, in order to prevent environmental damage, where the ship owner does not do so itself.

The conventions provide four guiding principles to define the extent to which the costs of preventive measures shall be compensated.³⁵ First, only measures that aim to prevent significant environmental damage come into play and the competent court will decide whether the damage is significant or not.³⁶ Secondly, preventive measures must be reasonable, again according to the

34. Stoiber, C., Baer, A., Pelzer, N. and Tonhauser, W., Handbook on Nuclear Law, IAEA 2003, p. 5.

35. See Article I(1) of the 1997 Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage Article I of the Convention on Supplementary Compensation for Nuclear Damage and Article 1(a) of the 2004 Protocol to Amend the Paris Convention on Third Party Liability in the Field of Nuclear Energy.

36. According to the conventions the competent court is the court of the contracting state in whose territory the nuclear incident occurred.

decision of the competent court, this means that the measures must be appropriate and proportionate having regard to all circumstances, for example the nature and extent of the risk of environmental damage, the extent to which preventive measures are likely to be effective at the time they are taken and relevant scientific and technical expertise. The test of *reasonableness* is designed to discourage speculative claims. The preventive measures must also have been taken after a nuclear incident has occurred or after an event creating a grave and imminent threat of nuclear damage has occurred. The burden of proof that a nuclear incident has occurred or at least that there was an event creating a grave and imminent threat of environmental damage will be on the person seeking compensation for the cost of taking the preventive measures. Thirdly, if the measures preventing environmental damage are taken by private persons, they must have been approved by the competent authorities in the state in which the measures have been taken, if such approval is required under the law of that state. Finally, such measures will only be compensated to the extent determined by the law of the competent national court.³⁷

1.5 *Compensation of environmental damage caused by nuclear incidents*

If the three lines of defence to prevent environmental damage are unsuccessful, then compensation for “nuclear damage” suffered will be the next step. “Nuclear damage” as it relates to the environment is defined under the new and revised international liability and compensation conventions to mean the costs of measures to reinstate an environment that is significantly impaired due to a “nuclear incident” to the extent that they have not already been compensated as “property damage”; for example, the costs of measures to reinstate the fauna after contamination of the beautiful birds in the Bay of Somme, the *Walhalla* of French ornithologists, due to a nuclear incident occurring in Normandy, France, to the extent that such costs have not been compensated as “property damage”. It also means loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as a result of a significant impairment of that environment, and insofar as it has not already been compensated as “property damage”.³⁸ For example, tourists may stay away from a particular holiday resort because the public beach used by the resort is contaminated by radiation. Since the owner of the resort is not the owner of the beach, the fact that the beach is contaminated does not constitute a loss of or damage to the resort owner’s property. Yet it will almost certainly result in a loss of income to the resort owner who will be entitled to compensation if it can show a sufficient economic interest in the use or enjoyment of the damaged environment.³⁹

In this section the author will primarily focus on the costs of measures to reinstate a significantly impaired environment. But what does this new head of damage exactly mean? It is true that this head of damage reflects the “polluter pays” principle and it is equally true that

37. This means that the extent of compensation for measures to prevent environmental damage is left to the competent court to determine. It does not mean that such compensation is optional.

38. This category of economic loss is sometimes labelled as “pure economic loss” because it is an economic loss incurred by a person which is not related to any property damage suffered by that person.

39. Unlike the 1997 Protocol to amend the Vienna Convention, the 2004 Protocol amending the Paris Convention requires the economic interest in the use or enjoyment of the environment to be “direct”. This is intended to ensure that compensation will not be awarded for nuclear damage that is too remote in the chain of causation. The holiday resort owner in the above example will only be compensated if it is demonstrated that there is a geographic proximity between the resort and the environment (the contaminated public beach) and that the business of the hotel depends upon guests being able to use that beach.

measures of reinstatement cost money, thereby allowing for an “amount” of compensation to be calculated. However, as Bowman writes, there is little practical significance in the notion that the polluter must pay unless it can be established precisely for what he must pay and exactly how much it will cost him.⁴⁰ Different options exist to reinstate the fauna in the above mentioned example of the contamination of birds in the nature reserve, each of them at a different cost: for example, all birds in the nature reserve could be replaced by new birds of the same type; alternatively, only certain protected species of birds that have been contaminated to such an extent that their survival is in danger could be replaced, while the others would remain in the nature reserve; another option would be to acquire an alternative non-contaminated site with the same types of birds as the ones that have been contaminated.⁴¹

The nuclear liability conventions do provide some guidance. They define “reinstating the environment” as reinstating or restoring damaged or destroyed components of the environment or introducing, where reasonable, the equivalent of these components in the environment.⁴² The conventions fall short of explaining what is meant by “restoring components of the environment” or by “introducing the equivalent of these components in the environment” and leave it up to the competent court to determine it.⁴³ Perhaps the approach reflected in other legal instruments, such as the EU Environmental Liability Directive or those comprising the civil liability regime for oil pollution might provide help to the competent court in this regard.

The EU Environmental Liability Directive (2004) establishes a framework whereby biodiversity damage, water damage and land damage are prevented and remedied through a system of operator’s liability. The directive distinguishes between damage to water or biodiversity and damage to land.⁴⁴ Remediation of damage to water or biodiversity is achieved through the restoration of the environment “to its baseline condition”, meaning the condition at the time of the damage of the natural resources and services that would have existed had the environmental damage not occurred, estimated on the basis of the best information available. Remediation of land damage means, at the very minimum, that relevant contaminants are removed, controlled, contained or diminished in such a way that the contaminated land, taking into account its current

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40. Bowman, M., “The Definition and Valuation of Environmental Harm”, in Bowman and Boyle (ed.), *Environmental Damage in International and Comparative Law*, Oxford University Press 2002, p. 1.
 41. The following example does not relate to a nuclear incident but illustrates the idea of purchasing an alternative ecosystem. In order to compensate the “loss” of the ecological characteristics on the 180 ha site at Cadarache, the French public authorities obliged the project company of the international ITER project on nuclear fusion to purchase and manage 480 ha of land with similar characteristics elsewhere in France.
 42. Article I(g) of the 1997 Convention on Supplementary Compensation for Nuclear Damage, Article 1(viii) of the 2004 Protocol Amending the Paris Convention on Nuclear Third Party Liability and Article I(1)(m) of the 1997 Vienna Convention on Civil Liability for Nuclear Damage.
 43. See for example the Explanatory Texts to the 1997 Vienna Convention and the 1997 Convention on Supplementary Compensation; Pelzer, N., “Learning the Hard Way: Did the Lessons Taught by the Chernobyl Nuclear Accident Contribute to Improving Nuclear Law”, in *International Nuclear Law in the Post-Chernobyl Period*, Joint NEA-IAEA Report, p. 105; Wagstaff, F., “The Concept of Nuclear Damage under the revised Paris Convention”, in Pelzer (ed.) *Internationalisierung des Atomrechts*, Tagungsbericht der AIDN/INLA Regionaltagung 2004 in Celle, Baden-Baden 2005, p. 197 et seq.; Soljan, V., “The New Definition of Nuclear Damage in the 1997 Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage”, in *Reform of Civil Nuclear Liability, Budapest Symposium 1999*, p. 59 et seq.
 44. See Annex II to the directive.

use or approved future use at the time of the damage, “no longer poses any significant risk of adversely affecting human health”. The approach of the EU Environmental Liability Directive derives from the general attitude of a legislature on how an unimpaired environment should be re-established.

On the other hand, the civil liability regime for oil pollution set forth in the Civil Liability Convention for Oil Pollution Damage (1992) stipulates that compensation for impairment of the environment, other than loss of profit from such impairment, shall be limited to the costs of reasonable measures of reinstatement actually undertaken or to be undertaken.⁴⁵ The convention does not explain what is meant by “reinstating” the environment, but the IOPC Funds have, over the years, been involved in the settlement of claims arising out of numerous incidents and have developed certain principles as to the interpretation of that definition.⁴⁶ The main principles are reproduced in the IOPC Fund 1992 Claims Manual. It appears from the manual that what is deemed possible under the EU Environmental Liability Directive, at least for damage to water and biodiversity, would not be possible for oil pollution. The manual acknowledges that it is virtually impossible to bring a damaged site back to the same ecological state that would have existed had the oil spill not occurred, and that therefore the aim of any reasonable measures of reinstatement should therefore be to re-establish a biological community in which the organisms characteristic of that community at the time of the incident “are present and are functioning normally”.⁴⁷

The new and revised nuclear liability conventions leave it to the competent court to determine to what extent a damaged environment should be reinstated after a nuclear incident. Judges thus have a very important role to play, but they do have some useful guidance. First, the conventions stipulate that the competent court should only hold nuclear operators liable for measures of reinstatement which are reasonable and which have been approved by the competent authorities of the state where the measures are taken.⁴⁸ Nuclear operators will only be liable for the costs of measures to reinstate an environment that is significantly impaired, leaving it to the competent court to determine whether the impairment is significant. These guiding principles help define this new head of damage and make it “operable”. Judges also have guidance from interpretations emanating from other similar legal instruments. They might choose to adopt either one of the two interpretations provided by the EU Environmental Liability Directive and the oil pollution regime, depending on what component of the environment is being reconsidered, or perhaps they will select some other approach altogether. According to Dr. Soljan, bringing the environment back to its condition prior to the nuclear accident is not an option since “...the desire to restore the environment to its condition prior to the nuclear incident shall be subject to the rule of reason”.⁴⁹ Time will tell whether the courts agree.

45. See Article 1 of the International Convention on Civil Liability for Oil Pollution Damage (1992).

46. The IOPC Funds are intergovernmental organizations which provide compensation for oil pollution damage resulting from spills of persistent oil from tankers. For more information, see Jacobsson, M., “The Concept of Pollution Damage in the Maritime Conventions Governing Liability and Compensation for Oil Spills” in *Reform of Civil Nuclear Liability, Budapest Symposium 1999*, p. 37.

47. 1992 International Oil Pollution Compensation Fund Claims Manual, p. 31.

48. See Section 1(4) of this article for the definition of “reasonable”.

49. Soljan, V., “The New Definition of Nuclear Damage in the 1997 Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage”, in *Reform of Civil Nuclear Liability, Budapest Symposium 1999*, p. 77.

2. Extra-territorial application of environmental law in the nuclear field

Over the last decades there has been a trend in OECD member countries to become more protective of the environment. Legislation has been adopted progressively to avoid and reduce negative impacts of industrial activities on the environment. But the increasing globalization of business and expanding regulation of commerce by states have also led to a significant rise in the application of national laws outside national borders. Driven by the saying that “a nuclear accident anywhere is a nuclear accident everywhere” and hence by a moral obligation to protect the environment wherever those industrial activities are taking place, those countries may be tempted to impose their strict environmental legislation not only on activities related to nuclear facilities on their own territories but also on projects located outside their borders. Nuclear vendors would then be obliged to comply with their own national environmental legislation even where their activities (e.g. construction, servicing, decommissioning) are being carried out abroad.

A myriad of questions relating to two main issues arise in this regard. First, does the application of national laws on foreign territory (“extraterritorial application”) per se have negative effects on international trade and investment as the International Chamber of Commerce purports? Is there a high risk that the extraterritorial application of environmental law will subject nuclear vendors to conflicting or overlapping legal requirements, that it will foster unpredictability, increase the risk involved in commercial activities and expose them to overly burdensome litigation in foreign jurisdictions? Will it encourage forum shopping, duplicate legal proceedings and potentially divergent outcomes?⁵⁰ Or could extraterritorial application also lead to positive effects, with the environment in customer countries that have less developed environmental legislation benefiting from the application of the stricter regulations of supplying countries, or at least from some minimum environmental standards? Over the past two decades it has often been alleged that nuclear supply and service companies in developed countries conduct their activities in developing host countries in accordance with much lower environmental standards than those adopted in their home countries. But should companies in developed countries not be required to respect their own national environmental legislation in all circumstances, even when operating abroad and regardless of whether there is any financial support from the home country involved? Would compliance with the environmental standards “at home” not ultimately be part of the general duty of care which suppliers of nuclear technology owe to the recipients and to the world at large and which was recently invoked by the Director General of the IAEA, Dr. ElBaradei?⁵¹ Obliging such companies, by law, to comply with the environmental standards of their home countries when carrying out work on nuclear facilities in developing host countries may perhaps ultimately benefit the environment in the host countries. Customer countries may not like the idea of having foreign environmental law applied to activities taking place on their territory from a sovereignty point of view, but they may also consider that it is in their best interest to preserve their national environment.

Secondly, do countries have the right under public international law to apply their environmental legislation abroad? Is a supplier country legally entitled to impose its environmental legislation on nuclear projects located in customer countries? For example, does the parliament of

50. Policy Statement of the International Chamber of Commerce on Extraterritoriality and Business, 13 July 2006, available at: www.iccwbo.org/uploadedFiles/ICC/policy/trade/Statements/103-33%205%20Final.pdf.

51. Speech given by Dr. ElBaradei at the high-level session marking the 50th Anniversary of the OECD Nuclear Energy Agency in Paris, 16 October 2008, available at: www.nea.fr/html/general/50th/Mr._ElBaradei_IAEA.pdf.

Country X have the right to require that an EIA be carried out in accordance with Country X's laws for work to be performed by one of its nuclear supplier companies on nuclear facilities located in Country Y? Is the national assembly of Country A legally entitled to impose its environmental standards relating to radiation emissions on nuclear projects realised by Country A's nuclear vendors in Country B? Does it make any difference whether the government of Country X or Country A is, in some way, financing the nuclear project or otherwise assisting its nuclear supplier companies to carry out their work?

This part of the article deals with the second question. The author does not pretend to give a definite answer but aims at providing *food for thought*. In particular, an examination will be made of the restraints which affect the right of states to apply their environmental protection legislation to nuclear activities in foreign countries. Assuming that national legislatures have the right to do so, an analysis will follow of whether non-compliance with environmental standards can be enforced both nationally and abroad.

It is important to note that the principles of international law governing the legal effect of national legislation outside the geographical territory of the legislature are truly principles, and not rules. A lot of debate is going on between countries on this issue and it is not certain whether agreement can ever be obtained. Legal principles governing jurisdiction have a fundamental importance in international relations. Since they determine both the reach of a state's law and the boundaries of that state's particular public order, it is no surprise that they are also one of the most controversial fields of international law. A lot of doctrine exists, especially in the United States, on whether a legislature implicitly means to make its legislation applicable not only on national territory but also abroad.⁵² However, it is not the purpose of this article to get involved in a study of the rules of statutory interpretation.

Section 2.1 which follows, introduces the notion of jurisdiction, the customary international law approach that governs jurisdiction and lists the most relevant grounds to claim jurisdiction. In section 2.2, the author argues that there exists a legal basis under customary international law which may entitle a national legislature to apply environmental legislation to nuclear energy projects abroad.

2.1 *Notion of jurisdiction under public international law*

The issue of the extraterritorial effect of environmental requirements relating to nuclear projects is intrinsically related to the notion of jurisdiction under international law. The term *jurisdiction* derives from the Latin "juris-dicere" which literally means "stating the law" or "declaring what the law is" in relation to persons or conduct. According to Lowe, "jurisdiction" is the term that describes the limits of the legal competence of a state or other regulatory authority (such as the European Community) to make, apply and enforce rules of conduct upon persons.⁵³

52. Brennan, D.C., "Extraterritorial Application of Federal Wildlife Statutes: a New Rule of Statutory Interpretation", *Cornell International Law Journal*, Vol. 12:143, p.143; Almond, H.H., "The Extraterritorial Reach of United States Regulatory Authority over the Environmental Impacts of its Activities", *Albany Law Review*, Vol. 44, p. 739; "The Extraterritorial Scope of NEPA's Environmental Impact Statement Requirement", *Michigan Law Review*, Vol. 74:349, p. 349; Lewis, B., "Analysing the Extraterritorial Application of the National Environmental Policy Act", *Tilburg Foreign Law Review*, Vol. 8:313, p. 313.

53. Lowe, V., "Jurisdiction", in *International Law*, 2nd edition, Evans, M.D. (ed), July 2006, Oxford.

Jurisdiction is an aspect of sovereignty and usually refers to the power of states to make rules (“legislative or prescriptive jurisdiction”), the power to enforce compliance with the rules (“enforcement jurisdiction”) and to subject persons to its courts (“adjudicative jurisdiction”). The first concept, legislative jurisdiction, refers to the jurisdiction to prescribe. It denotes the power of a state under international law to enact laws and regulations and apply them to certain conduct, relations and persons. The second, enforcement jurisdiction, refers to a state’s power under international law to enforce or compel compliance or to punish non-compliance with its laws or regulations, whether through courts or by executive, administrative or police order. The last concept, adjudicative jurisdiction, is a state’s power to subject persons or conduct to the process of its courts or administrative tribunals. The questions on extraterritoriality which are raised in this article relate to prescriptive and enforcement jurisdiction.

The basic rule under customary international law is that a state is prohibited from exercising jurisdiction as it sees fit unless there is a permissive principle to the contrary.⁵⁴ The particularity of this rule is that the state claiming jurisdiction must demonstrate the existence of a specific ground enabling it to exercise that jurisdiction. Therefore, states which oppose another state’s extraterritorial jurisdiction will tend to rely on this approach and require the state asserting jurisdiction to demonstrate that there is a permissive principle enabling it to do so.

Several principles are forwarded by states under customary international law to justify legislative and enforcement jurisdiction. They are also often invoked to ground extraterritorial jurisdiction. These principles all start from the idea that there needs to be a clear connecting factor, of a kind whose use is approved by international law, between the state asserting jurisdiction and the conduct that it seeks to regulate.

One of the most widely recognised basis for jurisdiction is the *territoriality principle*. According to this principle, states have the power to adopt and enforce legislation to regulate conduct on their territory. The underlying idea is that a state is free to render its legislation applicable to any person within its national territory, including foreign nationals. Under a strict application of the territoriality principle, every state has the exclusive right to apply its legislation within its national territory but has no authority to legislate outside that territory. National legislation of a foreign state or an agreement between states may constitute an exception to the territoriality principle to the extent that such legislation or agreement allows the legislation of one state to be applicable on the territory of another state.

A second basis for jurisdiction which is firmly established in international law is the *nationality principle*, sometimes denoted as the active personality principle. Under this principle, a state claims the competence to regulate the activities of its nationals, even if they reside abroad. The notion of “national” refers not only to natural persons but also to legal persons such as companies and their subsidiaries. One of the main economic advantages of the nationality principle is that it enables states to apply their tax laws to citizens living and earning their income abroad.

A third basis for jurisdiction is the *protective principle*. This principle enables a state to exercise jurisdiction *vis-à-vis* acts which threaten its essential interests or which are directed

54. Under international law an alternative approach to the question of jurisdiction exists that is based on the judgment of the Permanent Court of International Justice in the 1927 Lotus case. The author does not address this approach because it does not cover extending national standards and rules to activities carried out under jurisdictions other than the one under which the standards and rules were issued. The Lotus case happened on the High Seas where, in general, no national jurisdiction applies.

against its security. Accordingly, when its vital interests are threatened by activities, even if carried out by non-nationals outside its territory, a state may exercise its jurisdiction. Examples of acts that justify jurisdiction grounded on the protective principle are counterfeiting the national currency or high treason.

A final basis for jurisdiction that is worth mentioning in the scope of this article but that is a much contested one and has found less than general acceptance is the *effects principle*. According to this principle, conduct which produces substantial effects in a particular state may be subjected to the jurisdiction of that state even if it concerns conduct by non-nationals or conduct outside the territory of that state.

2.2 *Admissibility of extraterritorial jurisdiction in the field of environmental protection*

The author will test the right of a national legislature to impose environmental requirements on work performed in connection with nuclear facilities abroad in light of the main principles invoked by countries to claim jurisdiction under customary international law. The analysis will be done on the basis of the example of Country X's national legislature wishing to impose its environmental requirements on the construction, by a Country X nuclear vendor, of a nuclear power plant in country Y.

2.2.1 *Extraterritorial legislative jurisdiction*

The *territoriality principle* does not seem to be the right tool to claim extraterritorial legislative jurisdiction in this case. It only enables the legislature of Country X to impose environmental standards on nuclear projects that are realised on its territory. Unless there is an agreement with Country Y, it does not grant the legislature of Country X the right to impose environmental standards on nuclear projects that are realised on the territory of Country Y, not even by companies that have the nationality of Country X.

In the author's view, the *effects principle* will not, in principle, justify extraterritorial legislative jurisdiction for environmental matters either. In *Natural Resources Defence Council Inc. v Nuclear Regulatory Commission (NRC)*,⁵⁵ the question was whether the decision to issue an export licence for a nuclear reactor to the Philippines triggered the requirement under U.S. environmental law to conduct an EIA when the only significant environmental impacts would be felt in the importing country. The Court of Appeals relied on foreign policy grounds to support its holding that U.S. environmental law did not apply to the export licence. On this basis, the author therefore maintains that the legislature of Country X is not entitled to invoke the effects principle to justify imposing environmental standards on the radiation emissions of a nuclear project in Country Y, not even if it was built by companies that have the nationality of Country X. This does not mean that the effects principle is of absolutely no use for extraterritorial legislative jurisdiction; it might authorise states to assert jurisdiction over the construction of nuclear projects that are located just across their border, arguing that such projects may generate significant environmental impacts that could be incurred on their national territory.

Nor does the author think that environmental protection can be considered a vital state interest so as to justify extraterritorial legislative jurisdiction on the grounds of the *protective principle*. Although the category is not closed, the protective principle seems to be reserved for acts that threaten national security. It would be hard to imagine that the legislature of country X

55. *Natural Resources Defence Council Inc. v Nuclear Regulatory Commission*, 647 F.2d 1345 (D.C.Cir. 1981).

could reasonably invoke the protective principle to justify imposing environmental standards on the quality of the water that is to be ejected by nuclear power plants in country Y, even if they are to be constructed by companies that have the nationality of country X.

The *nationality principle* may lead to a different outcome however. The nationality principle establishes the right of a legislature to attach legal consequences to the conduct of its nationals wherever the conduct occurs, even outside the national territory of the legislature. The principle is mainly invoked in relation to criminal law. Many countries, particularly those with a legal system based upon the civil law model, claim jurisdiction over crimes committed by their nationals, notwithstanding that the offence may have occurred in the territory of another state. Common law countries tend to do so as well, although their claims are often restricted to very serious crimes such as treason and murder.

One example of an initiative to exert extraterritorial legislative jurisdiction in the environmental law field on the basis of the nationality principle is the June 2000 Bill for a Corporate Code of Conduct Act that was introduced in the U.S. House of Representatives.⁵⁶ The bill, which was never adopted, requires U.S. nationals, including U.S. based corporations, employing more than twenty persons in a foreign country, either directly or through foreign affiliates, to comply with internationally recognised environmental standards and with U.S. federal environmental laws that would be applicable if the operations were conducted in the U.S. Although the author is not aware of any successful precedent, he believes the nationality principle may constitute a valid ground to justify extraterritorial legislative jurisdiction in the field of environmental protection and hence could enable legislatures to prescribe laws that extend the application of domestic environmental regulations to the foreign operations of nuclear vendors who are nationals of the home country.

However, the nationality principle has its limitations. As noted above, the notion of “national” refers not only to natural persons but also to legal persons such as companies. The nationality of companies is a matter for each state to determine under its own laws but there is no single test of nationality. Common law states tend to accord nationality to companies on the basis of their incorporation in the territory of the state, regardless of where the actual business or management of the company is carried out (“incorporation theory”). Most civil law states, on the contrary, prefer to grant nationality on the basis of the place where the company has its management seat regardless of where the company is incorporated (“real seat theory”).

The nationality principle allows legislatures to regulate the activities of companies that have its nationality. If a nuclear facility is constructed by a company that has the nationality of the state that plans to exercise jurisdiction, the nationality principle will enable the legislature of that state to apply its environmental legislation to that nuclear activity. However, if the nuclear facility is constructed by a foreign subsidiary of that company with the subsidiary having a distinct legal personality, the nationality principle may not serve its purpose, at least not in countries adhering to the incorporation theory. If the subsidiary is incorporated in the foreign country and its nationality is determined on the basis of its place of incorporation, it will not be regarded as a national of the home country of the parent. In such cases, the nationality principle would not enable the parent company’s home country to exercise extraterritorial legislative jurisdiction over the nuclear activities conducted by the foreign subsidiary.

56. Corporate Code of Conduct Act, H.R. 4596, 106th Cong., 2000.

2.2.2 *Extraterritorial enforcement jurisdiction*

Even if the nationality principle may enable legislatures to grant extra-territorial effect to their environmental legislation, international law does not allow states to enforce that legislation in another state.

In contrast to the principles governing legislative jurisdiction, international law governing the exercise of enforcement jurisdiction is clear and simple. A state cannot take measures on the territory of another state by way of enforcement of its national laws without the consent of the latter. Persons may not be arrested, fines may not be enforced, tax investigations may not be mounted and orders for production of documents may not be executed on the territory of another state, except under the terms of a treaty or other consent given. It is this principle that dictates, for example, that British authorities have no right to enter Russian territory and arrest suspects in the recent polonium intoxication case involving the death of a former agent of the Russian Federation's Federal Security Office, Alexander Litvinenko. The United Kingdom's enforcement jurisdiction, like that of every other state, is in principle limited to its own territory. This is why states need to seek the extradition of persons accused of committing crimes within their jurisdiction in a case where the accused is living in another state.

Therefore, if the company that has the nationality of Country X constructs a nuclear power plant in Country Y and does not comply with the environmental requirements imposed by the legislation of Country X, public authorities of Country X cannot enforce compliance in Country Y unless there is a bilateral or multilateral agreement to that effect with the latter.⁵⁷ However, even where there is such an agreement, regular enforcement is crucial to detect, and prevent further, evasion of environmental legislation. Since environmental laws are generally enforced through the administrative process, the effectiveness of environmental law enforcement can be gauged by the strength and integrity of the administrative law regime. In this respect, many of the developing host countries may lack the institutional and legal frameworks in their administrative branches that are needed to enforce the environmental regulations of the home country of the nuclear vendor.

2.2.3 *A possible alternative solution*

Considering this legal limitation as well as the political tensions that may be caused between the host country and the supplying country resulting from interference with the sovereignty of the former, the author wonders whether it would not be more appropriate to search for a legal basis other than the *nationality principle* to oblige companies in developed countries to respect the own national environmental legislation when carrying out nuclear activities abroad. A possible solution to make the foreign activities of nuclear vendors subject to strict environmental standards is to oblige them to meet such standards on a contractual basis rather than through the extraterritorial application of the environmental legislation of the home country of the nuclear vendor, as illustrated by the 2003 recommendation on export credits of the Organisation for Economic Co-operation and Development (OECD).⁵⁸

57. However, the authorities of Country X may have jurisdiction to impose a fine on the company in Country X.

58. OECD Council Recommendation on Common Approaches on Environment and Officially Supported Export Credits [C(2003)236, as amended by the OECD Council in C(2004)213 and TAD/ECG(2007)9].

Contracts for export credits serve as the legal instrument in the OECD recommendation to ensure respect for environmental standards. The recommendation urges export credit agencies in OECD member countries to evaluate the environmental impact of projects prior to taking decisions on officially supported export credits.⁵⁹ When undertaking environmental reviews, the projects must be benchmarked against the environmental standards of the host country as well as those of the World Bank Group or Regional Development Banks.⁶⁰ The projects must comply with host country standards but must also meet the relevant international standards where these are more stringent than host country ones.⁶¹ If a project potentially has significant adverse environmental impacts, an EIA must be carried out giving the public at least 30 calendar days to be informed about its environmental impact prior to a final commitment to grant official support.

New and major expansion projects in nuclear power stations and other nuclear reactors, including the dismantling or decommissioning of such power stations or reactors⁶² as well as in installations designed for the production, or enrichment of nuclear fuels, the reprocessing, storage or final disposal of irradiated nuclear fuels, or for the storage, disposal or processing of radioactive waste are mentioned as illustrations of projects that require an EIA.⁶³

On the basis of the environmental review, OECD member countries and their export credit agencies may decide to decline official support, to provide such support without conditions or to provide such support subject to prevention and/or mitigation measures and monitoring requirements. Although the OECD recommendation is not legally binding on OECD member countries and only applies to projects that benefit from officially supported export credits and in essence only focuses on environmental reviews and EIAs, it certainly is a valuable first step to make internationally recognised environmental standards applicable on nuclear projects in foreign countries.

3. Conclusion

The focus of nuclear law has traditionally been on the protection of people and property. Public awareness of the harmful effects of certain industrial activities and the Chernobyl accident have led to a growing tendency for environmental regulation to cover the nuclear field as well. Environmental law entered the nuclear field both *directly* by making nuclear activities subject to international environmental law, and *indirectly* by introducing the concept of environmental protection in international nuclear law. Recent international law developments in public access to nuclear information, public participation in nuclear decision-making and prevention of and

59. Export credit agencies can be government institutions or private companies operating on behalf of government.

60. The OECD Council Recommendation mentions the ten World Bank Safeguard Policies, or where appropriate, all eight International Finance Corporation Performance Standards, or the relevant aspects of the standards of the Regional Development Banks, or the relevant internationally recognised standards, such as European Community standards, that are more stringent than those standards referenced above (see Article 12 of the 2007 edition).

61. Article 13 of the OECD Council Recommendation foresees that in exceptional circumstances a project that does not meet the international standards against which it has been benchmarked may be supported.

62. Except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load.

63. See the illustrative list in Annex 1 to the OECD Recommendation.

compensation for environmental damage caused by nuclear incidents are proof that environmental law is indeed in evidence in the nuclear field and that its significance is increasing steadily. Bearing in mind the words of the French writer Victor Hugo that “progress is nothing more than a friendly revolution”, it is important that nuclear law experts and nuclear energy experts help guide the further development of environmental law and its impact upon nuclear activities in order to encourage its growing symbiosis with nuclear law.

In connection with that growing symbiosis, it is logical to examine the value of ensuring that the most beneficial environmental law requirements are applied to nuclear projects, wherever they are undertaken. This of course raises the issue of whether public international law permits national legislatures to impose their own environmental law requirements on activities undertaken in connection with nuclear projects abroad, which in turn requires an examination of the principles governing extraterritorial jurisdiction. In the author’s view, the nationality principle may well provide a legal basis under customary international law entitling a national legislature to apply its environmental legislation to activities undertaken in connection with nuclear facilities in foreign countries by companies that have that legislature’s nationality. However, the importance or usefulness of that application will undoubtedly be severely limited by the concept of nationality as applied to legal persons as well as by the inability of that same state to enforce its legislation in a foreign country without the latter’s agreement thereto.