

***The obligations and mechanisms resulting from international
responsibility of radioactive pollution of the environment***

الالتزامات والآليات الناتجة عن المسؤولية الدولية
في مجال التلوث الإشعاعي للبيئة

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Abstract:

This article aims to clarify the foundations of modern international responsibility; resulting from pollution the environment with radioactive materials. as constituting environmental damage; regardless of adherence to the established basis for this responsibility, given that the protection of environment are the cornerstone of human rights that must be protected in accordance with the modern international plan, without political; ideological, or geographical considerations.

It should also be taken into consideration, the set of obligations that result from radioactive pollution of the environment. Where the party is responsible in front of many solutions, either by correcting the act committed to restore the situation , or saving the environment as it leads to accepting new international mechanisms that reduce, and put an end to the violations that the environment is experiencing pollution from radioactive materials.

Keywords: The international responsibility, the environment; the radioactive materials, radiation environmental damage.

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ملخص :

يهدف هذا المقال إلى توضيح أسس المسؤولية الدولية الحديثة الناتجة عن تلوث البيئة بالمواد المشعة باعتبارها أضرارًا بيئية، بصرف النظر عن الالتزام بالأساس الثابت لهذه المسؤولية، نظرًا لأن البيئة وحمايتها هما حجر الزاوية لحقوق الإنسان التي يجب حمايتها وفقًا للخطة الدولية الحديثة، والتي تتحد معظم الدول لتحقيقها دون اعتبارات سياسية أو أيديولوجية أو جغرافية.

كما يجب أيضًا أن تؤخذ في الاعتبار مجموعة الالتزامات الناتجة عن التلوث الإشعاعي للبيئة، حيث يكون الطرف مسئولًا أمام العديد من الحلول ، إما بتصحيح الفعل الملتزم بإعادة الحالة إلى ما كانت عليه أو إنقاذ البيئة على النحو الذي يؤدي إلى قبول آليات دولية جديدة تقلل ، وتضع حدًا للانتهاكات التي تتعرض لها البيئة من المواد المشعة.

الكلمات المفتاحية: المسؤولية الدولية، البيئة، المواد المشعة، الضرر البيئي الإشعاعي.

Introduction

Carrying out harmful acts arranges the responsibility of individuals and states, whether in local laws or in international law, as it based on its rules that the affected party can restore the situation to its right or be able to compensate fairly for the damage it has suffered.

We will deal specifically with the international responsibility resulting from the peaceful use of nuclear energy, which may cause damage that leads to radioactive pollution that would undermine the pillars of environmental security that states and international organizations seek to protect.

Some types of international responsibility for legitimate acts in the use of nuclear energy stipulated in international agreements, whether those concerned with responsibility for polluting the environment with nuclear radiation in its peaceful use, or other agreements in which talk was made about international responsibility to complete its legal presentation of the topic for which it was found.

This is what necessitates us to research the concept of environmental damage and the international basis for the establishment of international responsibility for pollution of the environment with radioactive materials, as we will show the total international obligations arising from environmental pollution with radioactive materials, as well as various new

international mechanisms to protect the environment from radioactive pollution.

From this point, we will discuss the extent of the ability of modern international obligations and mechanisms to cover environmental damage resulting from environmental pollution under international responsibility, by answering the following question:

-What are the obligations and mechanisms resulting from international liability in relation to radioactive pollutants of the environment?

First main title: International liability for radioactive environmental damages

International responsibility is a legal consequence; arises in the situation of infracting an international obligation; of an international legal person infract the obligation occurred, which is a principle recognized in international law, organized by a set of rules that have been produced by international practices, and legal rules. This principle constitutes the main pillars of the international legal system; as a guarantee of the implementation of its rules and the actual dedication of the mandatory provisions of it as an actual embodiment the maintenance of international peace and security.

First subtitle: The concept of radioactive environmental damage

There is no international responsibility for radioactive contamination of nuclear materials in peacetime. If there is no nuclear damage, or an act that resulted in radioactive damage; which led to the disruption of the balance of law ; environment, and radiation security together. The image of this imbalance in the pollution of the environment with radioactive materials, which causes radiation damage to the environment and people, both internationally and internally, whether the damage occurred directly or indirectly¹.

Environmental damage is every act that affects a person in himself, his money, body, health, and his natural or ecological environment², as result of prejudice to the elements of the environment and disturbing its balance, whatever the nature of the damage and whatever the environmental element it exposed to prejudice.³

Environmental damage is an essential component of international responsibility in polluting the environment⁴. It cannot done without harm, as it is not sufficient for an illegal act, or a violation of an international

obligation to implement the rules of international responsibility for environmental pollution with radioactive materials, but radioactive damage that threatens a person must be available in the environment⁵.

The environmental radioactive damage mentioned in many international agreements that dealt with the issue of environmental pollution with nuclear radiation, including Paris convention⁶ and Vienna convention:

a- The General Convention on Civil Liability for Nuclear Damage Vienna 1963⁷: The General Agreement on Civil Liability for Nuclear Damage states the issue of radioactive environmental damage in detail, especially in Article One⁸, Paragraph (k) stipulating the following: "Nuclear damage means:

- Death or personal injury, or any loss or damage to property, arising from or resulting from radiological properties, or from a combination of radiological, toxic, or explosive properties, or other hazardous properties that characterize nuclear fuel, products, or characteristic waste of nuclear material received from a nuclear facility or nuclear material generated within or sent to a facility⁹.
- Any losses or other damages that arise or result in this way if the law of the competent court stipulates this and to the extent stipulated in it¹⁰.
- Death, personal injury, or any loss or damage to property arising from or resulting from other ionizing radiation emitted from any other radioactive source present inside the nuclear facility, if the law of the state of the facility provides for that.

b- Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal¹¹: It is mentioned in both the first and second articles, where the Convention and in most of its articles, especially the first and second, deal with the damages resulting from the transport of hazardous wastes and their disposal, and detailed in most of the waste that arranges dealing with it harmful to the environment, and this is stated in its fourth article, Paragraph 02, "C" and "D" by stipulating¹²:

- Ensuring that, the persons involved in the management of nuclear waste, take the necessary steps to prevent pollution from hazardous materials, waste resulting from that management¹³, to reduce the effects of that pollution on human health and the environment to the lowest possible extent if pollution occurs.

- *Ensure that, the movement of hazardous wastes and other wastes across borders is reduced to a minimum; in line with the environmentally sound and effective management of these wastes. The movement is conducted in a manner that provides protection; for human health and the environment from the harmful effects of this movement¹⁴. Mine its geographical area; accurately or that we limit it with physical insulators, for its speed of transportation and its impact on the environment. Which is characterized by; the coherence of its elements, where the radioactive environmental damage is characterized by an important time property¹⁵, it may be immediate that pollution causes the nuclear accident occurs; such as death of workers; immediately after the nuclear reactor exploded in Chernobyl. The characteristic of instantaneous radiation damage; is usually characteristic when talking about the damage it causes to humans. As it equal to instantaneous or continuous in its impact on the environment, because the interconnection between the elements of the environment may contribute to covering up the features of radiation damage. Which causes the detecting pollution, only after its development; and exacerbation.*

From it, the damage of radioactive contamination to the water is transmitted to the air and then to the earth. To reach plants, animals and humans¹⁶, and this is what has emerged in the nuclear accident in Waterford¹⁷, where the radioactive environmental damage has a ladder consisting of seven degrees to measure the percentage of its danger to the environment and the human being, which is known as the Aynes scale . "To arrange nuclear catastrophes, which escalate from the natural state where there is no environmental radiation damage, to reach the ssituationh degree in which the radioactive environmental damage is at its peak, making the accident a great catastrophe, such as the Chernobyl accident and the Fukushima nuclear accident.

Second subtitle: The basis of international liability for polluting the environment with radioactive materials

The establishment of international responsibility towards a person in public international law requires relying on a theory to which that responsibility is subject, and despite the multiplicity of these theories that dealt with the basis of international responsibility, international jurisprudence and work have not settled on a unified basis to date.

The fact of the matter is that the requirements, the nature of the legal relationship, and the quality of the radioactivity that causes the damage, imposes itself on international jurisprudence, to choose the basis that governs the legal relationship established for international responsibility, mistaking, the theory of illegal international action, and the theory of risk¹⁸.

The basis of the international responsibility for pollution of the environment with radioactive materials is in error theory¹⁹: The error theory is established in the articles of responsibility for pollution of the environment on the basis of tort liability, and this is primarily due to the error, which is a breakthrough in the natural behavior of countries.

Also, the novelty of environmental rights and international environmental law have contributed greatly to the introduction of the theory of error, due to pollution damage, the diversity of its sources and the difficulty to address it, especially with the increase of environmental damage.

The error achieved when the state fails to perform the duties imposed on it. The degree of failure of the state; in its international obligations, if we compare the degree of its commitment, to the same duty at the national level, and the international level²⁰. Hence, the wrongful act is the act; or negligence that includes a violation of the provisions of international law; or entails the violation of rights recognized by international law²¹. Likewise, the International Law Commission in the process of preparing a draft law, on State responsibility, has highlighted the great role that the internationally wrongful doctrine, can play in establishing international responsibility for harming the marine environment. However, as result of scientific and technological progress, the legitimate activities themselves have caused severe damage at the level of the environment in general, and the marine environment in particular the internationally wrongful acts²².

The state asks within the scope of international law; a fault-free responsibility in situations in which it engages in an activity of an unusual nature of danger²³. Since this situation, it has to bear the risks that result from this activity, which is very dangerous. This theory; applied in the Rome Convention in 1952 concerning the liability for damage to others on the surface of the Earth from airplanes flying in the air, as can also be referred to the Convention on Liability for Damage Caused by Space Devices approved by the United Nations General Assembly, on November 29; 1970 in general.

As for the responsibility for pollution of nuclear radioactive materials, we also refer to the 1962 Brussels Convention, which is

responsible for damage caused by nuclear ships, as is the matter with regard to the Vienna Convention of 1963 on liability for nuclear damage, as was confirmed in the United Nations Convention on the Law of the Sea of 1982²⁴.

Jurisprudence tended to acknowledge the absolute responsibility for the damages resulting from the use of dangerous and legitimate activities, and the theory of risk means establishing responsibility for the person responsible for a dangerous activity for what he causes by other damages, and without resorting to proving a mistake on his part.

This theory is one of the types of objective responsibility, not based on a personal standard; to establish the international responsibility. Nevertheless, it notes the absence of an explicit textual text stipulating international responsibility; on basis of the theory of risks for damage affecting the marine environment pollution with nuclear radiation, despite the existence of two agreements in the field of transporting nuclear waste and the responsibility of the ship operator²⁵.

This allowed; the application of customary international rules, that have long been used by international action. Which; constitute the general rule stable in the international legal system, and according to this general rule, the international responsibility is based on the unlawful act, as each country is only asked for its violation of an obligation. Whether harm results or not, because given the potential economic; and political repercussions for implementing the theory of risk²⁶. Countries are still afraid; even by concluding agreements, from establishing a system of automatic compensation, based on the theory of risk.

From it, states should reconsider the forms of international responsibility, ratios for polluting the environment; according to the modern international responsibility law. Jurists must re-adapt old legal theories; according to modern scientific developments, as well as according to the aspirations of countries; because it is clear that; the future environmental security is in front of two methods must chosen, one of them is either to prsituation the use of radiant energy in the peaceful field permanently. Which is clearly at first sight a sound solution, but after examination; and scrutiny we find that it is an impossible solution on the ground, as the international community; was not able to compel the disposal of all irrigation and nuclear use. So how can it get rid of reactors; with peaceful use that many countries believe; that the future of humankind depends on clean nuclear energy, without turning to its negative impact radiation, especially for northern countries, that cannot access solar energy because of its lack of climate that causes this²⁷.

Hence, the countries in general and the developed countries in particular, must view nuclear energy and its radiation as an enemy of the human right to environmental security more than a way to achieve the right to life.

Second main title: The obligations arising from polluting the environment with radioactive materials and the new international protection mechanisms

From the rules of international responsibility, obligations incurred by the person causing the nuclear accidents arise, to restore conditions to what they were; and these obligations, such as peaceful methods and available means to protect the environment from the risks of radioactive contamination²⁸.

The obligations are prsituationive and curative, and obligations to peacefully settle environmental disputes, and with increased environmental pollution with radioactive materials, the international legislator is keen to find many ways; even if they are simple to protect the environment in the future from any radiation hazards²⁹.

First subtitle: The obligations arising from environmental pollution with radioactive materials

According to the International Law Commission, every internationally wrongful act of a State entails the international responsibility of that State³⁰. A wrongful act defined as State conduct consisting of an action or omission attributable to the State and constituting a infraction of an international obligation of that State³¹. Thus, the first question to ask is whether nuclear activities can constitute an infraction of international obligations.

The obligations resulting from polluting the environment with radioactive materials divided into types according to their stages, which we mention as follows:

a- Prsituationive obligations are the sum of precautionary measures undertaken by nuclear states and facilities to avoid nuclear accidents, in coordination with the International Atomic Energy Agency, which works to exchange experiences and technologies between countries in the peaceful use of nuclear energy.

This will done by committing to international cooperation to prsituation radioactive contamination, as the previous commitment is more important than reparation for damage and subsequent reform because of

the exchange provided by international cooperation in terms of experiences and knowledge in the normal situation³².

In the time of emergency, that is- the time of the disaster - which will not enable the country affected by the nuclear disaster, to learn and quote modern techniques and methods in the field of dealing with nuclear disasters; resulting from the peaceful use of nuclear energy. Moreover, efforts must be made to protect the environment; as a common heritage of humankind³³. From it, states must cooperate with each other, to protect their environment from contamination with radioactive materials. This matter will achieve through concerted efforts; exchange of experiences, technologies and information. This would increase the productivity of modern countries in the nuclear field, as well as ensure the minimum safety of facilities and nuclear reactors.³⁴.

The principle of prudence and caution; is also based on forward-looking and predictive studies; based on scientific certainty and subject to accurate technical fields. Where there is no suspicion, as it is a principle characterized by precedence in anticipating nuclear disasters, which usually practiced by representative studies of the prospects. The principle of precaution and caution aims to create a type of proportionality, between the precautionary measures, benefits and cost of these measures³⁵.

Duty to notify, report in the situation of a nuclear accident, or radiological emergency. The state informs other countries in the situation of a nuclear accident, or radiological emergency in its territory. As an example, we find an early notification agreement in the situation of a nuclear disaster or nuclear accident in 1986, which came after the Chernobyl nuclear accident and we find that it stipulated the following: The country in whose territory a nuclear catastrophe occurs, is obligated to notify other countries that may affected by this catastrophe³⁶.

b- The principle of commitment to treat; is synonymous with the national principle of restoring the situation to what it was. This means; the commitment of the affected party to obligation; and pay compensation for the damage it caused³⁷. Due to; its failure to implement its international obligations; and therefore compensation is considered a positive act to repair the damage caused.

The obligation to restore the situation; and international jurisprudence, recognizes that compensation in kind is the general rule for repairing the damage. In addition; restoring the situation; in Lugano Agreement. Defined in its second article; eighth paragraph, by stipulating the following³⁸:

"The method of restoring the situation; is every reasonable means aimed at reformulating; repairing the necessary environmental components, as well as; means aimed at creating equivalence, if possible in relation to, the components of the environment."

From it, repairing radioactive environmental damage is either by restoring the environment that affected by pollution. Such as; removing radioactive waste from unauthorized landfills, or removing radioactive waste dumped in places not designated for that, or; arranging damage to the environment, or; by re-establishing the environmental conditions; for the contaminated area, also by removing unlicensed nuclear facilities³⁹. For example, this is the arbitration court's decision in the case of the ship, which was sunk by the French government, and which used by environmentalists to protest against the French nuclear tests in the Pacific. It relates to an infraction of international obligations, and the practice of arbitration; relates primarily to the moral or legal damage, which directly affects the state or its nationals; with an arrangement of international responsibility⁴⁰.

c- Commitment to the peaceful settlement of environmental disputes, as what countries suffered in the two world wars, pushed them to search for peaceful ways to resolve international disputes away from the threat or use of weapons, and from these means, we find negotiations, organizations and the international judiciary⁴¹.

Negotiations have emerged effectively in environmental issues, such as the Colorado River conflict, between the United States of America and Mexico⁴². It noted that, negotiations are the way to lead finding solutions for problems, resulting from environmental pollution in general, or pollution with radioactive materials in particular. Whether; by removing pollution or treating it or providing compensation, on maintenance work and reaching compromise solutions that satisfy all countries.

International organizations have an effective role in settling environmental disputes⁴³, due primarily to the comprehensiveness of regular or radiological environmental accidents, as it is the responsibility of all organizations to ensure that their basic principles applied in a sound environmental framework free from radioactive pollutants.

The United Nations Organization; has highlighted its role in working to draft an international law for the environment⁴⁴, protecting it in the legal fields. Care must also be taken to ensure that the rules are applied, bearing in mind the responsibility to pollute the environment with radioactive materials.

The resulting damage, and the United Nations is working hard to urge countries to exchange experiences and modern technologies, especially in the field Nuclear, and from it all members of the United Nations Organization must resolve their international disputes; by peaceful means, in a manner that does not endanger international peace; and security⁴⁵.

The IAEA, is making tremendous efforts; to protect the international environment from radioactive contamination, by introducing legal and scientific standards for nuclear installations, and increasing their safety⁴⁶. The IAEA strives for peaceful uses of nuclear energy to ensure that all countries enjoy its benefits, while respecting the agency's first principle, which is "the atom of peace"⁴⁷. This means that the International Atomic Energy Agency; is providing its assistance and endeavors in the peaceful field to use nuclear energy only.

The tendency to international jurisdiction in resolving international environmental disputes is one of the traditional means of resolving disputes of a grave and dangerous nature, as the parties to the conflict can turn to international jurisdiction in interpreting and implementing international agreements on responsibility for polluting the environment with radioactive materials⁴⁸.

It should also be noted, that the mandate of the International Court of Justice; is an optional mandate. In addition; some international agreements have granted the International Court of Justice inherent jurisdiction in the situation of a dispute over the articles of the Convention. As an example, the Law of the Sea Convention of 1982⁴⁹, also; the Convention on Biological Diversity 1992⁵⁰, the court is entrusted with resolving international disputes in the field of polluting the environment with radioactive materials. This is what stated in the appendix to the Vienna Convention 1963; related to civil liability for damages of nuclear energy⁵¹, judgments issued by the International Court of Justice; also have mandatory power for the parties to the conflict. Because; if a party refuses to implement the ruling, the second party may go to the UN Security Council to issue a decision on the measures to be taken to implement the ruling⁵².

In view of the interest, the International Court of Justice attaches to environmental issues, and the developments witnessed by international environmental law. We find that in 1993 a special room was created to solve environmental problems, and it consists of seven members to consider environmental issues, and considering arbitration; as a way of resolving disputes through judges chosen by the parties. Conflict for governance shall be as provided by law, and work in good faith to avoid international

disputes. Among the most important environmental issues referred to arbitration, is the "Case of Lake Lanoux,"⁵³ we conclude in general, that arbitration is among the effective international tools for resolving radiological environmental disputes if they exist in the future⁵⁴. Because of the possibility of choosing arbitrators, a feature that increases the strengthening of the principle of equality in the right to use peaceful nuclear energy.

Second subtitle: New international mechanisms to protect the environment from radioactive pollution

The reporting system introduced to international environmental law in accordance with the Stockholm International Conference⁵⁵, with the aim of obtaining a general assessment of the rate of states' compliance with the environmental obligations imposed on them to maintain environmental security, and to know the extent to which countries respect their obligations⁵⁶.

The reporting system; in its beginnings was limited to providing an inventory of the environmental facts of countries, in the field of the environment in general, and with regard to protecting the environment from radioactive contamination⁵⁷. We can see that the Basel Convention, even if it relies on the reporting system, does not have the legal authority to evaluate the data granted to it; or even direct countries to the legal rules that must be done. As states prepare a periodic report authorizing the movement and transfer of nuclear waste, and then hand it over to the Conference of the States Parties, without having the real authority to confront these reports⁵⁸.

The control system is one of the most effective systems in the field of nuclear weapons control, and this is because of international agreements that have banned the use of nuclear weapons and tightened control over their prohibition, as the (TPNW)⁵⁹.

In addition; since the right to use nuclear energy for peaceful purposes is a guaranteed right for all states, the control system remains unable to perform a cycle effectively, this is because the oversight of peaceful nuclear facilities of states would rise as a sensitive topic. Which is the subject of sovereignty, and this can reach the system, to accuse countries of each other without studied evidence. Because of the absence of the principle of goodwill in international relations, where this is primarily due to the sensitivity that the presence of international observers of one country may cause in another country, especially if there is a historical

conflict between the two countries, such as what exists between the United States American and Iran⁶⁰.

Therefore, the international community must develop from the control system, in a manner that allows the protection of the environment on the one hand, and to control the peaceful nuclear activities of states without prejudice to their sovereignty or their right to use peaceful energy for peaceful purposes⁶¹.

To urge countries to implement their obligations to protect the environment from radioactive contamination, The International law has developed a set of technological and financial assistance to provide the appropriate climate for exercising the right of states to use nuclear energy for peaceful purposes. Therefore, we find technological assistance, in this regard; we mention some cases of assistance that states provide to others⁶². In order to develop the peaceful use of nuclear energy according to the Atomic for Peace program, which President Eisenhower started in 1953, it transformed research reactors, transferred basic scientific technology and training to many developing countries.⁶³.

In addition to Canada and the United States' aid to India (1955), where Canada equipped India with a nuclear reactor, it worked with heavy water from the United States⁶⁴.

The Soviet Union also helped North Korea, in building a reactor for basic scientific research, and provided training, but it did not help North Korea by returning plutonium or other sensitive nuclear technology, this is a statement from him about her commitment to remaining nuclear armament⁶⁵.

Conclusion:

Despite the concerted efforts of the international community to appreciate the establishment of real rules for the obligations and mechanisms resulting from international responsibility in the situation of environmental damage, we need to highlight several points as follows:

- Countries must provide their assistance in any way without regard to political disputes between states. This is for two reasons: -The first is to generalize the use of nuclear energy to develop development. -The second goal is to quell nuclear catastrophes in the future by taking advantage of the experiences of countries; that have suffered from nuclear accidents in avoiding the causes of future accidents, and to maintain a healthy environment while ensuring the human right to environmental security.
- Strengthening the role of the International Court, as it is the main judicial organ of the United Nations, and its experience in settling

international environmental disputes, this is due to its experience in resolving judicial and international disputes and international relations, while activating its legal function by working to develop judicial arbitration mechanisms; commensurate with the modern environmental challenges.

- protecting the environment; in cases of nuclear pollution; regardless the geographical boundaries or political disputes.

- The reporting system is still in urgent need of its enjoyment of a mandatory force that enables the conduct of countries and their control in the field of the environment, especially in the field of nuclear waste transportation, and this is because of the danger this field poses to the environment and people. Nuclear and the peaceful uses of nuclear energy in the future will reduce potential nuclear environmental disasters.

- Countries must provide their assistance in any way without paying attention to political disputes between countries, and this has two goals. The first is to generalize the use of nuclear energy to develop development, and the second goal is to mitigate future nuclear disasters by taking advantage of the experiences of countries that have suffered from nuclear accidents in avoiding the causes of future accidents, to maintain a healthy environment and ensure the human right to environmental security.

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¹ IAEA Safety Standards Series: Radioactive Waste Storage, WS-G-6.1; International Atomic Energy Agency; Vienna, 2006; p14.

² IAEA bulletin, Effects of Ionizing Radiation on Plants, Animals at Levels Implied by Current Radiation Protection Standards, IAEA Technical Reports Series No. 332, Vienna 1992; p29.

³ Jilali Walid Najrawi, Responsibility for Pollution of the Environment in International Law, (Memorandum for Master's Degree), International Human Rights Law, Dr. Yahya Fares University, Medea, 2012-2013, p 118.

⁴ Sahar Amin Hussein, Encyclopedia of Environmental Pollution, Dar Degla, 2010, Amman, Jordan, pp. 19.20.

⁵ Michel prieur , Environmental Law, Dalloz édition,1991,p729-730.

⁶ Article 7 of the Paris Convention permits a Paris State to limit the liability of an operator (and thus the amount of compensation available) to 15 million SDRs. The OECD Steering Committee for Nuclear Energy, which is empowered to adopt recommendations concerning the Paris Convention, has recommended that Paris States limit the liability of an operator to no less than 150 million SDRs, but several Paris States have not implemented this non-binding recommendation fully. Article V of the existing Vienna Convention permits an existing Vienna State to limit the liability of an operator to 5 million 1963 United States gold dolla (approximately 60 million SDRs).

Article V of the revised Vienna Convention permits a revised Vienna State to limit the liability of an operator to 100 million SDR's during the first fifteen years after the revised Vienna Convention enters into force and thereafter to limit the liability of an operator to 300 million SDRs. The revised Vienna Convention has not yet entered into force.

⁷ The Vienna Convention on Civil Liability for Nuclear Damage: (adopted 21 May 1963, entered into force 12 November 1977), INFCIRC/500.

⁸ Article 1 defines nuclear damage to include 1- loss of life or personal injury. 2- Loss of or damage to property and each of the following, to the extent determined by the law of competent court. 3- Economic loss arising from loss or damage referred to in 1 or 2, insofar as not included in 1 or 2, if incurred by a person entitled to claim in respect of such loss or damage. 4- The costs of measures of reinstatement of impaired environment, unless such impairment is insignificant, if such measures are actually taken or to be taken, and insofar as not included in 2. 5- Loss of income deriving from an economic interest in any use or enjoyment of the environment, incurred as result of a significant impairment of the environment, and insofar as not included in 2. 6- The costs of preventive measures, and further loss or damage; caused by such measures. 7-Any other economic loss, other than any caused by the impairment of the environment, if permitted by the general law on civil liability of the competent court. The definition is clear that damage within all these categories, except preventive measures, must caused by the release of radiation.

⁹ The international convention regulating issues; of nuclear liability; which explicitly included military technologies under the scope of its application. The Convention on the Liability of Operators of Nuclear Ships, explicitly covered also warships, defined: "any ship belonging to the naval forces of a State, and bearing the external marks distinguishing warships of its nationality, under the command of an officer duly; commissioned by the government, and manned by a crew who are under regular naval discipline". However; in particular due to the intention to cover also these military technologies; the Convention on the Liability of Operators of Nuclear Ships; has never ratified by the required number of the states.

¹⁰Article one; paragraph K, Vienna General Convention on Civil Liability for Nuclear Damage; 1963.

¹¹ IAEA, The 1997 Vienna Convention on Civil Liability for Nuclear Damage and the 1997 convention on supplementary Compensation - Explanatory Texts. IAEA International Law Series, Vol. 3.Vienna 2017, pp. 20-22

¹² The Convention was endorsed by the 116 attending countries as the Final Act of the Conference of Plenipotentiaries on the Global Convention on the Control of Transboundary Movements of Hazardous Wastes. The Conference held in, Basel; Switzerland from March 20-22, 1989, was convened by the Exccutive Director of UNEP pursuant to decision 14/30, adopted by the Governing Counsel of UNEP on June 17, 1987.

¹³ Teodore Waugh, Where do we go here: Legal controls and future strategies for addressing the transport of hazardous waste across international borders. Fordham Environmental Law Journal, Vol. 11, No. 2 (SPRING 2000), pp. 477-479.

¹⁴ See *Basel Convention on the Control on Transboundary Movements of Hazardous Wastes and Their Disposal*, adopted and opened for signature Mar. 22, 1989, reprinted in *UNEP and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*.

¹⁵ Report of the First Meeting of the Conference of the Parties to the Basel Convention, at 2, U.N. Doc. UNEP/CHW,1/24 ,1992.

¹⁶ For a more detailed analysis of the recent development of the Basel Convention, see Kummer, *The Basel Convention: Ten Years On*, in *RECIEL* 73 (1998), p. 227 et seq.

¹⁷ Waterford Nuclear Accident, 25-05-1999, Connecticut, USA Where we find that the rate of damage in radiological accidents is responsible for determining the severity of the accident, and the extent of liability arrangement.

¹⁸ Williams Hereinafter, *Public International Law Governing Transboundary Pollution*, 1984 *INT'L Bus. Law*.pp 243, 243

¹⁹ Roger LeRoy Miller, Herbert D. Kelleher ; *legal environment today*, library of congress, 8th ed, 2016, pp530,583.

²⁰ Mohsen Afekereen, *International Environmental Law*, First Edition, Arab Renaissance House, Cairo, 2006, p,148.

²¹ Article 01 the draft legal codification of the rules of international responsibility, within the report of the 56th session of the International Law Commission, 2001.

²² Meng, Qing-nan, *Land-based marine pollution: international law development*, British Library, 1987; pp85;86.

²³ Jurisprudence, known to call this theory many terms, Some of them call it the objective theory, the theory of responsibility without error, the theory of absolute responsibility, and in our research we will call it the theory of risk, on the basis of the dangers that the peaceful use of nuclear energy carries.

²⁴ See the Vienna General Convention on International Liability for Civilian Damage, 1963, as well as the 1982 Convention on the Law of the Sea.

²⁵ Daud Hassan, *Protecting the marine environment from land-based sources of pollution*, Ashgate Publishing Limited Gower House Croft Road Aldershot Hampshire GU11 3HR, England, 2005, pp84,85.

²⁶ Muhammad Tawfiq Saudi, *marine pollution, and the extent of liability of the shipowner* , Dar Al-Amin , 2001, pp33,36.

²⁷ In this regard, there is a process known as ending nuclear energy in English: Nuclear power phase-out is the process of stopping the use of nuclear energy in generating electric energy. Ending nuclear energy involves closing nuclear power plants. Ending nuclear energy began in Sweden (1980), Italy (1987), Belgium (1999), and Germany (2000). The issue was also discussed in many other European countries. Austria and Spain also passed laws prohibiting the construction of new nuclear plants. So can they actually be achieved?

²⁸ Radioactive waste: addressing the challenges, IAEA Review No. 55 - 3 September 2014;pp3,5.

²⁹ Environmental protection from impacts Ionizing radiation, *Proceedings of an international conference Stockholm*, October 6-10, 2003, August 2005, p 351,352.

³⁰ Draft Articles on Responsibility of States for Internationally Wrongful Acts, G.A. Res. 56/83. Annex art. 1, U.N. Doc. A/RES/56/83 (Dec. 12, 2001) (hereinafter Draft Articles on State Responsibility)

³¹ Id, at art. 2

³² Carnino Gasparini, *Safety Aspects of Seawater Desalination*, Section of Nuclear Facilities Safety, IAEA, Vienna 1997.

³³ Saeed Salem Goueili, *Facing environmental damage between reality and treatment*, Emirates University Journal, 1999, p. 03.02

³⁴ Mamdouh Hamed Attia, Sahar Mustafa Hafez, *Radiation Hazards*, Dar Al Fikr Al Arabi, Cairo, Edition 1, 2005, pp. 156,157.

³⁵ Muhammad Safi Yusuf, *The Precautionary Principle of Environmental Damage*, Arab Renaissance House, Cairo, 2008, p. 28.

³⁶ Article 05, the Convention on Early Notification of a Nuclear Accident or Radiological Disaster of 1986.

³⁷ Anzilotti, *Cours de droit international*, Voli, Sidam bador, P385. (14)-Reiter (P) : *Droit international Public*, 1968, P144.

³⁸ Convention on, jurisdiction and the recognition and enforcement of judgments in civil and commercial matters, see the Lugano Convention, 30 October 2007; OJ L57 of 03/03/2017, p.63.

³⁹ The White Paper on Environmental Responsibility, presented by the Council of the European Union, Brussels, 02-02-2000, p. 02.

⁴⁰ The operation to sink the ship: " the Rainbow Warrior". Which was symbolically called: the demonic operation, was an operation carried out by the Business Department of the French Foreign Intelligence, which is called, the General Department of Foreign Security (DGSE), and was implemented on the tenth of July 1985, during that process, two undercover operatives sank the Greenpeace fleet command ship in the port of Auckland, New Zealand as the French government wanted to prevent the ship from interfering with a nuclear weapons test that was planned for Moreowa.

⁴¹ The legal experts held a conference in the Italian city of Pelago in 1974 AD to study the concept of avoiding environmental conflict: see this: Bitar (F) , Op, cit , p159.

⁴² *Sharing Colorado River Water: History, Public Policy and the Colorado River Compact*" Archived 12 May 2008 at the Wayback Machine [ag.arizona.edu](http://www.arizona.edu) August 1997.see also: Jeroen Kuiper, *The Colorado, a River in Conflict*, <http://www.disputedwaters.com/articles/27/01/2011/opgedroogd>.

⁴³ Peter H. Sand, *The Effectiveness of International Environmental Agreements: A Survey of Existing Legal Instruments*, Cambridge University Press, 1992, pp 454,456.

⁴⁴ United Nations Environment Programme, *Selected Texts of Legal Instruments in International Environmental Law*, UNEP/Earthprint, 2005, p25.

⁴⁵ *Bulletin of the Atomic Scientists*, Educational Foundation for Nuclear Science, Inc, Vol. 46, N° 6juil; 1990;pp2,3.

⁴⁶ Atomic Energy Agency, *Radiological Assessment Reports Series*, STI/PUB/1068 IAEA; 1998 *The radiological accident in Tammiku*. International Atomic Energy Agency,

Vienna, Report STI/PUB/1053 IAEA, (1998): *Isotope techniques in the study of environmental change*; Vienna.

⁴⁷ "Atoms for Peace" was the title of a speech delivered by U.S. President Dwight D. Eisenhower to the UN General Assembly of the United Nations on Peaceful Uses of Atomic Energy, New York City on December 8, 1953.

⁴⁸ Bertal Abdul Qadir, *Towards an independent international judiciary for environmental disputes and crimes*, *Ijtihad Journal for Legal and Economic Studies*; Volume: 09, 2020, p 313.

⁴⁹ The United Nations Convention on the Law of the Sea establishes a comprehensive regime for law and order in the world's oceans and seas that establishes rules governing all uses and resources of the oceans. It enshrines the notion that all the problems of surrounding space are closely related and must be addressed as a whole, the agreement was opened for signature on 10 December 1982 in Montego Bay, Jamaica.

⁵⁰ The Convention on Biological Diversity (CBD) is an international legally-binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions, which will lead to a sustainable future.

⁵¹ Salah Khairy Jaber, *International Protection of Biodiversity*, Master Thesis submitted to the Faculty of Law, University of Baghdad, 2004, p. 149.

⁵² Mezairaq Abdul Aziz, *the role of the United Nations in protecting the environment from pollution*, a memorandum submitted for a master's degree, Faculty of Law, University of the Montessori Brothers of Constantine, academic year: 2012/2013, p. 86.

⁵³ This arbitration concerned the use of the waters of Lake Lanoux, in the Pyrenees. The French Government proposed to carry out certain works for the utilization of the waters of the lake, and the Spanish Government feared that these works would adversely affect Spanish rights and interests, contrary to the Treaty of Bayonne of May 26, 1866, between France and Spain, and the Additional Act of the same date. In any event, it was claimed that, under the Treaty; such works could not be undertaken without the previous agreement of both parties.

⁵⁴ Koivurova Timo, *Introduction to International Environmental Law*, Routledge, 2013, p21.

⁵⁵ *Protect the environment from the effects of ionizing radiation*, the International Conference Proceedings Stockholm, October 6-10, 2003.

⁵⁶ The IAEA has established a programme for developing standards that specifically address the protection of both humans and other species, the programme includes a number of mechanisms for providing for their application.

⁵⁷ The IAEA and the co-operating organizations have interrelated responsibilities with regard to environmental radiation protection. The IAEA has unique statutory responsibilities within the United Nations (UN) family for establishing standards of radiation safety – and by implication ones for environmental radiation protection – and for providing for the application of those standards at the request of any State.

⁵⁸ See paragraph 16 of Article 16 of the Basel Convention of 1989.

⁵⁹ *The Treaty on the Prohibition of Nuclear Weapons (TPNW), or the Nuclear Weapon Ban Treaty, is the first legally binding international agreement for comprehensively prohibit nuclear weapons, with the goal of leading towards their total elimination, it was passed on 7 July 2017, in order to come into effect, signature and ratification by at least 50 countries is required. As of 23 March 2020, 36 states have ratified the treaty. For those nations that are party to it, the treaty prohibits the development, testing, production, stockpiling, stationing, transfer, use and threat of use of nuclear weapons, as well as assistance and encouragement to the prohibited activities. For nuclear-armed states joining the treaty, it provides for a time-bound framework for negotiations leading to the verified and irreversible elimination of its nuclear weapons programme.*

⁶⁰ <https://www.nytimes.com/2020/01/09/world/middleeast/us-iran-conflict.html>, Max Fisher, *The U.S., Iran and a No-Win Game*.

⁶¹ Sami Muhammad Abd al-Hamid, *International Organization International Community United Nations*, first edition, the faculty of knowledge Alexandria, the year 2000, p. 234.

⁶² *IAEA Series , Technical Support for Nuclear Power Plants and Programs*, No. NP-T-3.28, October 2018, pp, 65,67.

⁶³ Hewlett, Richard G. and Jack M. Holl. *Atoms for Peace and War, 1953-1961: Eisenhower and the Atomic Energy Commission*. Berkeley: University of California Press 1989.

⁶⁴ Perkovich, George, *India's Nuclear Bomb; the Impact on Global Proliferation*; Berkeley: University of California Press 1999.

⁶⁵ Wit, Joel S., Daniel B. Poneman, and Robert L. Gallucci, *Going Critical: The First North Korean Nuclear Crisis*. Washington DC: Brookings 2004.