

Study on the Legal Liability for Nuclear Discharge in Japan

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Abstract: In 2023, the Japanese government decided to discharge the nuclear sewage into the sea after treatment. Because the nuclear sewage may have a certain degree of impact on the marine environment, after the Japanese government made this decision, many countries and international organizations in the international community are paying close attention to the incident. The purpose of this paper is to analyze the possible harm to the ocean caused by the discharge of nuclear sewage into the sea in Japan, and to propose some feasible solutions to this harm. This paper investigates through the literature research method, specifically enumerates the circumstances in which the discharge of nuclear sewage into the sea may violate international customs and international conventions, and also expounds the legal responsibility of the Japanese government in the case of nuclear sewage discharge from the perspective of traditional state responsibility and transboundary damage liability. Based on an analysis of the violation of international customs and conventions, it is concluded that the Japanese government's discharge of nuclear sewage into the sea does not fully comply with international customs and a series of international conventions, such as *the United Nations Convention on the Law of the Sea* and *the Convention on Nuclear Safety*, and the Japanese government should be held responsible. The discharge of nuclear sewage into the sea is also a very important issue for the global environment. The international community should strengthen cooperation, give top priority to environmental protection, and safeguard the overall interests of all countries in the world.

Nuclear sewage is mainly formed by contamination of water bodies with radioactive substances from nuclear accidents or nuclear reactions. According to the German Agency for Marine Science and Research, within 57 days of the start of the Japanese nuclear sewage discharge, hazardous radioactive substances had already spread to the Pacific region, and the carbon 14 in them could cause genetic damage. 2023 Excessive levels of radiation have been detected in fish caught in the vicinity of Fukushima, Japan, and long-term consumption of these fish may result in developmental deformities, haematopoietic and neurological damage, among other hazards. In addition, the discharge of nuclear sewage into the sea will also affect global ecological security and harm global marine ecological and environmental security.

1. International Legal Regime for the Discharge of Nuclear Effluent from Japan into the Sea

In studying the allocation of responsibility for the discharge of nuclear effluent from Japan into the sea, it is important to analyze the international legal regime for this issue in terms of international custom as well as international conventions.

1.1 International Custom

According to article 38, paragraph 1, of the Statute of the International Court of Justice, an international custom is "accepted as law as evidence of a general practice".^[1] Scholars have generally interpreted international custom under this provision as a general practice or usage accepted as law. It is thus clear that international custom requires both the existence of a general practice or usage and its acceptance as law by States.

In response to the incident of Japan's nuclear effluent discharge into the sea, the Japanese Government claimed that the discharge of nuclear effluent into the sea was in line with international custom. However, it has been proved that there is a big difference between nuclear sewage and industrial wastewater discharged in the course of production in international custom. Industrial wastewater is produced as a result of industrial production, and it contains many materials for industrial production, intermediate products, by-products and pollutants produced during the production process that are carried in the water. For example, electrolytic salt industrial wastewater contains mercury, heavy metal smelting industrial wastewater contains lead, cadmium and other metals, and so on. Although many toxic substances in industrial wastewater will have a greater risk to human safety, but in accordance with the composition and content of pollutants in the wastewater, the use of appropriate purification methods to be treated to achieve normal discharge. On the other hand, the discharge of nuclear sewage poses a great danger and violates a number of legal obligations, and is therefore unlikely to be recognized as an international custom by all parties in the world.

1.2 International Conventions

International conventions refer to international multilateral treaties on politics, economy, culture, technology and so on. The international community has concluded many international treaties on nuclear pollution and the preservation of the marine environment, and the following is an analysis of the determination of responsibility for the Japanese nuclear sewage discharge incident from the point of view of two international conventions related to it.

1.2.1 United Nations Convention on the Law of the Sea

The *United Nations Convention on the Law of the Sea* (UNCLOS) refers to the *Law of the Sea Convention* (LOSC) resolved by the Third United Nations Conference in 1982. Article 192 of UNCLOS establishes the responsibility of each State to protect the safety of the marine environment.^[2] Article 194, paragraph 2, establishes the obligation of each State in the international community to prevent pollution of the environment and damage to the sea or land beyond the limits of sovereignty.^[3] Article 195 provides that States in the international community should take appropriate measures to prevent the extension of damage to other States or to the marine environment.^[4] Article 213 also

¹ Refer to Article 38 of the ICJ Statute.

² Refer to Article 192 of the UNCLOS, "States have the obligation to protect and preserve the marine environment."

³ Refer to Article 194 of the UNCLOS, "States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other States and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the areas where they exercise sovereign rights in accordance with this Convention."

⁴ Refer to Article 195 of the UNCLOS, "In taking measures to prevent, reduce and control pollution of the marine environment, States shall act so as not to transfer, directly or indirectly, damage or hazards from one area to another or transform one type of pollution into another."

contains express provisions on enforcement in respect of pollution from land-based sources.^[5]

The Government of Japan, in choosing the least costly of the various solutions, has chosen to discharge the nuclear waste into the sea, which, while protecting its own interests, violates the obligation of States under the Convention to do everything in their power to minimize the damage of pollution caused by their own actions and to protect the interests of other States. Moreover, the Government of Japan should take effective measures to avoid the adverse effects of the disposal of nuclear effluent from being extended to the marine environment or other countries. From the above analysis, it can be seen that the decision of the Government of Japan to discharge nuclear sewage into the sea is, to a certain extent, in violation of the substantive provisions of the UNCLOS.

In addition, Japan's decision to discharge nuclear effluent into the sea violates the procedural provisions of the UNCLOS. Article 198 establishes a notification obligation for States when they discover that damage may have been caused by their own actions.^[6] Article 200 imposes an obligation on States to disclose information about damage of which they become aware and to cooperate actively in exploring solutions.^[7] Monitoring of the risk or effects of pollution is also explicitly provided for in article 204,^[8] and the publication of assessments of possible impacts on the oceans and seas to the States of the world is provided for in articles 205^[9] and 206 of the Convention.^[10]

The Government of Japan should disclose the situation of possible marine pollution, the nature of the nuclear effluent and the extent of the pollution before the discharge of the nuclear effluent into the sea, and actively discuss with all countries in order to formulate effective remedial measures. In addition, the Government of Japan should monitor the situation after the discharge of the nuclear effluent in a timely manner and disclose all the real results of the monitoring, so that the countries and international organizations with interests in the surrounding area can be informed of the pollution caused by the nuclear effluent in a timely manner and avoid any damage to their interests as soon as possible. However, the Government of Japan has failed to disclose in a timely manner the contamination monitoring report in accordance with the Treaty, which does not disclose all the nuclear elements contained in the nuclear effluent. This behavior of the Japanese Government may cause the contamination to continue to spread and lead to more damages. As a result, the Government of Japan's discharge of nuclear effluent into the sea was also in breach of its obligations of notification, monitoring and remediation under UNCLOS.

1.2.2 *Convention on Nuclear Safety*

Article 6 of the *Convention on Nuclear Safety* provides that all States parties to the Convention must take appropriate measures to monitor that all nuclear-related equipment currently in their

⁵ Refer to Article 213 of the UNCLOS, "States shall enforce their laws and regulations adopted in accordance with article 207 and shall adopt laws and regulations and take other measures necessary to implement applicable international rules and standards established through competent international organizations or diplomatic conference to prevent, reduce and control pollution of the marine environment from land-based sources."

⁶ Refer to Article 198 of the UNCLOS, "When a State becomes aware of cases in which the marine environment is in imminent danger of being damaged or has been damaged by pollution, it shall immediately notify other States it deems likely to be affected by such damage, as well as the competent international organizations."

⁷ Refer to Article 200 of the UNCLOS, "States shall cooperate, directly or through competent international organizations, for the purpose of promoting studies, undertaking programmes of scientific research and encouraging the exchange of information and data acquired about pollution of the marine environment. They shall endeavor to participate actively in regional and global programmes to acquire knowledge for the assessment of the nature and extent of pollution, exposure to it, and its pathways, risks and remedies."

⁸ Refer to Article 204 of the UNCLOS, "1. States shall, consistent with the rights of other States, endeavor, as far as practicable, directly or through the competent international organizations, to observe, measure, evaluate and analyze, by recognized scientific methods, the risks or effects of pollution of the marine environment. 2. In particular, States shall keep under surveillance the effects of any activities which they permit or in which they engage in order to determine whether these activities are likely to pollute the marine environment."

⁹ Refer to Article 205 of the UNCLOS, "States shall publish reports of the results obtained pursuant to article 204 or provide such reports at appropriate intervals to the competent international organizations, which should make them available to all States."

¹⁰ Refer to Article 206 of the UNCLOS, "When States have reasonable grounds for believing that planned activities under their jurisdiction or control may cause substantial pollution of or significant and harmful changes to the marine environment, they shall, as far as practicable, assess the potential effects of such activities on the marine environment and shall communicate reports of the results of such assessments in the manner provided in article 205."

possession is in conformity with the express provisions of the Convention.^[11] In certain circumstances, each State party should ensure the safety of nuclear facilities in its possession or take certain appropriate measures to improve the safety of nuclear facilities. Article 10 provides that all States parties to the Convention must ensure that all nuclear-related behavior is in conformity with all policies on nuclear safety set out in the Convention.^[12]

After investigation by the relevant authorities, the nuclear facilities at the Fukushima nuclear power plant, which was the source of the nuclear effluent incident in Japan, have exceeded the expiry date stipulated in the Convention, and the facilities of the Tokyo Electric Power Company (TEPCO), which were used beyond the expiry date of the Convention, have also violated the explicit provisions of the Convention on Nuclear Safety. In addition, Japan, as a State party to the Convention on Nuclear Safety, is obliged to take certain measures to safeguard the safety of facilities carrying out nuclear-related activities in accordance with the provisions of the Convention, but it did not do so after the Fukushima Earthquake, which resulted in the harm caused. In conclusion, the decision of the Government of Japan to discharge nuclear sewage into the sea is in violation of the corresponding provisions of the Convention on Nuclear Safety and has serious implications for the safety of the global human and marine environments.

2. Composition of Liability for the Discharge of Japanese Nuclear Sewage into the Sea

The legal responsibility of States included not only traditional State responsibility, but also include responsibility for transboundary damage arising from the direct consequences of damage. The view of the scholar Zhou Gengsheng is that the rights and obligations of a State coexist, and that while enjoying certain rights, it must also assume corresponding obligations. Liability for acts of seaward discharge will be studied from two perspectives.

2.1 Traditional State Responsibility

Although the *Draft Articles on Responsibility of States for Internationally Wrongful Acts* (also known as the *Draft Articles on International Responsibility*) are only a draft, they have been invoked in practice by the International Tribunal for the Law of the Sea on the basis of the Draft. According to article 2 of the *Draft Articles on International Responsibility*, an internationally wrongful act is defined as an internationally wrongful act committed by that State when responsibility for that act is attributable to the State, whether it is an act of commission or omission, and when the act is in breach of an international obligation expressly provided for in an international convention or treaty.^[13] The breach of international conventions and customary international law by Japan's discharge of nuclear effluent into the sea has already been mentioned in the previous section on international law regimes, and this part will only deal with the aspects of attribution of responsibility for that act.

Article 4 of the Draft Articles on International Responsibility made it clear that responsibility was attributable to the State for acts performed by State organs, whether legislative, executive or judicial, irrespective of the status of the State organ in the organization of the State and irrespective of the

¹¹ Refer to Article 6 of the *Convention on Nuclear Safety*, "Each Party shall take appropriate steps to ensure that the safety of nuclear installations existing at the time of entry into force of this Convention for that Party is reviewed as soon as possible. For the purposes of this Convention, the Party shall, if necessary, ensure that all reasonably practicable improvements are taken as a matter of urgency to improve the safety of nuclear installations. If such improvements cannot be achieved, the plan to decommission the nuclear installation shall be implemented as soon as possible. The date of decommissioning shall be determined taking into account the overall energy situation and possible alternatives as well as social, environmental and economic impacts."

¹² Refer to Article 10 of the *Convention on Nuclear Safety*, "Each Contracting Party shall take appropriate steps to ensure that all organizations engaged in activities directly related to nuclear installations develop due priority policies for nuclear safety."

¹³ Refer to Article 2 of the *Draft Articles on International Responsibility*, "There is an internationally wrongful act of a State when conduct consisting of an action or omission:(a) Is attributable to the State under international law; and(b) Constitutes a breach of an international obligation of the State."

character of the State organ in the central or local units.^[14] Article 8 provides that when a person or enterprise in a State carries out an activity under the control of the State Government, the subject of responsibility for that activity shall be attributed to the State and not to the person or enterprise.^[15]

For the act of nuclear sewage discharge into the sea, externally it is the decision made by TEPCO, but due to the special and dangerous nature of nuclear elements, the act of nuclear sewage discharge into the sea cannot be made by only one company, the Japanese government must occupy a corresponding dominant position in this incident. In 2021, the Japanese government clearly informed TEPCO to make appropriate preparations for the discharge of nuclear sewage into the sea, and explicitly declared that the discharge of nuclear sewage into the sea was the most sensible course of action. No matter from the news report or the supportive behavior of the Japanese government itself, the Japanese government knew and agreed to the discharge of nuclear sewage into the sea, and it can even be said that TEPCO was making the decision according to the instruction of the Japanese government. In view of the above, the Japanese government should be held responsible for the discharge of nuclear sewage into the sea.

2.2 Liability for Transboundary Harm

Article 1 of the *Draft Articles on International Liability for Harmful Consequences Arising out of Acts Not Prohibited by International Law* provides for the application of the draft articles in respect of acts not prohibited by international law which cause harm through matter. Article 4 of the draft provides that all States of the international community have the right to take action to the maximum of their available resources to mitigate the risk of harm or the occurrence of harm in the event that transboundary harm was likely to be or had been caused by an activity carried out by them.^[16] The Government of Japan, despite the availability of other alternative measures, had chosen to discharge into the sea, the least costly measure that would cause the greatest damage to the marine environment and other States. According to the data provided by TEPCO, the treated nuclear sewage did not fully meet the criteria for discharge into the sea, and under such circumstances, the Government of Japan had continued to discharge the sewage into the sea on the basis of its previous decision and had not taken certain measures to address the damage that might be caused. Such behavior was contrary to the draft resolution's aim of minimizing the impact of the damage, and the Government of Japan should therefore be held liable for the environmental damage caused by the discharges.

The discharge of nuclear sewage into the sea is dangerous. Even though the Government of Japan claims that the treated nuclear sewage meets the standards for discharging into the sea, the nuclear sewage has been tested to contain some radioactive elements, and these retained radioactive elements may harm human health. Moreover, nuclear effluent discharged into the sea may damage the marine environment and affect ecological safety. Therefore, the Government of Japan should be held liable for transboundary damage in the event of actual damage resulting from the discharge of large quantities of nuclear effluent into the sea.

¹⁴ Refer to Article 4 of the *Draft Articles on International Responsibility*, "The conduct of any State organ shall be considered an act of that State under international law, whether the organ exercises legislative, executive, judicial or any other functions, whatever position it holds in the organization of the State, and whatever its character as an organ of the central government or of a territorial unit of the State. An organ includes any person or entity which has that status in accordance with the internal law of the State."

¹⁵ Refer to Article 8 of the *Draft Articles on International Responsibility*, "The conduct of a person or group of persons shall be considered an act of a State under international law if the person or group of persons is in fact acting on the instructions of, or under the direction or control of, that State in carrying out the conduct."

¹⁶ Refer to Article 4 of the *Draft Articles on International Liability for Harmful Consequences Arising out of Acts Not Prohibited by International Law*, "States shall take all appropriate measures to prevent or minimize the risk of causing significant transboundary harm. If such harm has already occurred, all appropriate measures shall be taken to minimize its effects."

3. Problems Encountered in Pursuing Liability for Nuclear Effluent Discharge into the Sea and Options for Improvement

3.1 Possible Problems of Accountability

3.1.1 Different criteria for determining the dischargeability of nuclear effluents

Article 4 of the *London Dumping Convention* states that all parties to the treaty must treat wastes or other potentially hazardous substances resulting from their production for subsistence or other activities in accordance with the Convention, that all wastes and other hazardous substances referred to in Annex I to the Convention may not be discharged under any circumstances. Wastes and other hazardous substances referred to in Annex II to the Convention may be discharged under special permits, and discharges of wastes other than those referred to in Annexes I and II are only subject to a general permit. However, the Convention does not specify whether the nuclear effluent that the Government of Japan has decided to discharge belongs to the wastes that are strictly prohibited in Annex I or those that can be discharged under a special permit in Annex II. It also does not specify the discharge standards and quantities of wastes that can be discharged under Annex II. As a result, it is difficult to accurately determine the responsibility that should be assumed, as it is easy to create differences in the process of pursuing responsibility.

3.1.2 Cross-border implementation difficulties

Firstly, the international community does not currently have an agency or international organization that can enforce that the State is the subject of responsibility, and the State can avoid post-litigation enforcement in accordance with its principle of sovereignty. Secondly, the standard of compensation for the incident varied from country to country, and it was impossible to reach a uniform standard of compensation. Thirdly, the provisions of the international conventions related to the incident are general and do not contain specific provisions, and the number of States parties to each international convention is not large, making it difficult to reach agreement on the applicable provisions. Consequently, it was very difficult to use judicial channels to enforce cross-border sanctions against the Government of Japan.

3.2 Improvements for Nuclear Sewage Discharges into the Sea

In response to the issue of accountability for the incident of nuclear sewage discharge into the sea, the following two points can be addressed to improve the situation.

3.2.1 Develop unified criteria for determining waste discharges into the sea

Today, neither the international conventions concluded by the international community nor the international customs developed in practice contain clear and uniform provisions on standards for waste discharge and environmental protection. Under such circumstances, it is difficult to hold countries or organizations responsible for causing environmental pollution, or unnecessary disputes may arise among countries in determining responsibility. Therefore, a uniform standard should be formulated for the discharge of wastes into the sea, with the participation of as many countries as possible. The criteria should specify the types, quantities and concentrations of wastes that may be discharged or prohibited, and should also indicate which wastes require the preparation of permits and other relevant procedures before they are discharged into the sea, so as to avoid disagreements in practice.

3.2.2 Strengthen enforcement by the international community

At present, the international community does not have a body with enforcement power, and it is often difficult to enforce after the international lawsuits have been concluded. Due to the differences in economic, cultural and social systems, each country wants to maximize its own interests, which leads to conflicts between countries in many areas, thus triggering international litigation. However, due to the lack of institutions capable of enforcing the results of litigation, in many cases countries will refuse to implement the results of litigation for their own interests, and it is impossible to pursue the responsibility of the acting country, and it is very difficult for damaged countries to get due compensation. To sum up, it is of great significance to strengthen the enforcement power of the international community. In order to strengthen the enforcement power, countries can enhance cooperation, promote cross-border enforcement, safeguard the interests of all parties in the international community and protect the environment. Through consultations, countries can form clear agreement provisions and make them legally binding, thereby strengthening the enforcement power of the international community.

4. Conclusion

An analysis of the discharge of nuclear sewage into the sea shows that the Japanese Government's handling of nuclear sewage is not perfect, does not fully comply with the degree of reasonableness and legality stipulated in international conventions, and does not take remedial measures after the discharge has taken place. The discharge of nuclear sewage from Japan has caused great damage to the marine ecosystem. The large amount of radioactive substances in nuclear sewage entering the sea may contaminate the water bodies and benthic organisms in the sea, thus affecting the entire biological chain. Moreover, the discharge of nuclear sewage can pose direct and indirect threats to human health. In addition, the discharge of nuclear sewage can cause long-term pollution of the marine environment. The long-term accumulation of radioactive substances in the oceans will pose a great obstacle to the recovery of marine ecology and the ecology of waters. It is therefore all the more important for countries around the world to take action and pay attention to the protection of the marine environment in order to create an ecological environment suitable for human life.

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