

State Responsibility for Transboundary Pollution and Its Assumption: The Case of Japan's Discharge of Nuclear Sewage

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Abstract: In recent years, the unilateral decision and behavior of Japanese government in discharging Fukushima nuclear-contaminated water without any guarantee of safety and reliability, despite the international community's skepticism, have aroused the concern and anger of the people of the world. The act of discharging the nuclear-contaminated water was carried out under the authorization and control of the Government of Japan, which is contrary to the obligations under the United Nations Convention on the Law of the Sea, the Convention on Nuclear Safety and other conventions to which Japan is a party, so it should be subject to the corresponding national responsibility. Regarding the assumption of responsibility, as the strength of the States themselves mainly promotes international legal obligations and responsibilities, Japan should withdraw its wrongful practice and assume its corresponding duties and responsibilities as soon as possible. The ocean makes the world's countries closely connected, and all countries' interests are closely intertwined, so it is necessary to build a national responsibility mechanism for transboundary pollution under the framework of international law. Based on the existing achievements, this paper discusses and analyzes the national responsibility for transboundary pollution and its assumption and the construction of the national responsibility mechanism, taking Japan's discharge of nuclear-contaminated water as an example in order to strive to provide helpful theoretical support for judicial practice.

Keywords: Nuclear effluents, international wrongful liability, State responsibility.

1. Introduction

The 2011 earthquake and tsunami that rocked northeastern Japan caused significant damage to Tokyo Electric Power Co.'s Fukushima nuclear power plant, which led to a radioactive waste leaking accident. Ten years later, on April 13, the Japanese government ultimately decided to release the highly radioactive raw nuclear waste from the Fukushima Daiichi accident into the Pacific Ocean after diluting it through the Multi-Nuclear Species Removal Facility (MNRFF). As of August 5, 2024, Japan has completed eight rounds of nuclear effluent discharge, totaling 62,400 tons. Japan's decision and actions have aroused concern among people in Japan and abroad, as well as national and international organizations, and ongoing discussions about the illegality and danger of these actions

scholars from various fields. The Director General of the International Atomic Energy Agency (IAEA), Mr. Tarosi, submitted the Fukushima Contaminated Water Disposal Report to the Japanese Prime Minister. And Japan used it to publicize Japan's endorsement of the discharge plan. However, the report was limited to the safety assessment of the ALPS system and was not related to the endorsement of the legitimacy of Japan's discharges. It could not allay the international community's suspicions.

It may cause significant damage to the ecosystem and indirectly damage the economy and society, such as affecting the development of tourism and fisheries. Still, it may also lead to a governance crisis in the relevant governance system, structure, and process and be damaging to human rights protection. Due to the large volume and duration of nuclear effluent discharges, they may not cause noticeable symptoms of radioactive diseases in the short term, and the information is concealed by national security and specific secrets. Hence, the problem of nuclear effluent discharge from Japan's discharges into the sea is characterized by a long-term and persistent nature, and it is essential to keep an eye on the issue and look for a solution. Therefore, in order to provide theoretical support for better safeguarding the international community and the legitimate rights of people from all countries, this paper discusses why Japan should assume state responsibility in accordance with the pertinent elements of international wrongful responsibility, discusses the form of its assumption of state responsibility, and finally makes suggestions for improving the mechanism of state responsibility for transboundary pollution control based on these.

2. Prerequisites for Japan's Assumption of State Responsibility

This paper analyzes the premise that Japan should bear State responsibility mainly from the perspective of responsibility for internationally wrongful acts, i.e., traditional State responsibility. Responsibility for internationally wrongful acts is judged by international law, emphasizing that the conduct of the state objectively violates the rules of international law and breaches international obligations, and constitutes an internationally wrongful act. The analysis that follows is predicated on the currently available facts and existing laws.

2.1. Responsibility for Internationally Wrongful Acts

According to the Draft Articles on Responsibility of States for Internationally Wrongful Acts adopted by the United Nations International Law Commission at its fifty-third session, an act constitutes an internationally wrongful act of a State if it is attributable to the state under international law, and the act constitutes a breach of an international obligation. However, in certain cases, there is a circumstance precluding the wrongfulness of conduct that would otherwise not be in conformity with the international obligations of the State concerned, such as consent, self-defense, etc. [1].

2.1.1. Discharging the Nuclear-contaminated Water as an Act Attributable to the State

Whether the action may be ascribed to the state is the main question in the context of attribution. Regarding the release of nuclear effluent in Japan, though TEPCO directly made the behavior of discharging radioactive effluent into the sea, the action was carried out under the authorization and control of the Japanese government. Before the Fukushima nuclear accident, TEPCO and the Japanese Government had a supervisory relationship. However, after the accident, Japan established the "Japan Atomic Energy Damage Compensation and Reactor Scrapping Support Organization", an official organization that holds 50.1% of the voting rights of TEPCO shares, indicating the actual control of the Japanese government over TEPCO. It has been argued that if a citizen's action is consented to or approved by the state or its ruler, then the state is considered the actual perpetrator of the harmful action, and the citizen is merely an instrument [2]. Accordingly, this behavior was

authorized by the Japanese government and executed under state authority, making it a state-attributable event.

2.1.2. Absence of Circumstances Precluding Japan's International Responsibility

Moreover, there were no circumstances that exempted Japan from international responsibility. It was evident that the incident of the discharge of nuclear effluent into the ocean did not involve self-defense, compliance with peremptory norms, or countermeasures, according to the seven grounds set out in ARSIWA, and that Japan's conduct could not satisfy the remaining four grounds for exemption from responsibility, consent, force majeure, and distress and necessity. Regarding consent, a State must validly consent to the commission of a particular act by another State, and the wrongfulness of that specific act is precluded only in relation to that state. The neighboring countries that will be significantly affected by the nuclear wastewater have been adamantly against Japan's act, such as China, which firmly opposed the discharge of radioactive water into the sea; the Ministry of Foreign Affairs of the DPRK, which has denounced the act as "an unforgivable crime against humanity". The Pacific Island countries, such as Fiji, have repeatedly voiced their opposition to the release of contaminated water into the sea. Although U.S. Secretary of State John Blinken claimed that the U.S. is "satisfied" with Japan's plan of discharging, the U.S. is actually one of the countries that will reduce its imports of agricultural, forestry, and fishery products the most in the first half of 2024, which is a contradiction of the statement that the U.S. agrees with Japan. Thus, the reason for the discharge is not valid, as the discharge did not have the consent of other countries. In terms of force majeure, although both the tsunami and the earthquake triggered the Fukushima nuclear accident, it was TEPCO's failure to adopt an appropriate strategy for the sake of safeguarding its economic efficiency, choosing to protect the costly reactors rather than maximize the protection of public safety, that delayed dozens of hours of precious time, and left the Japanese government facing the thorny situation of the nuclear effluent from the Fukushima Daiichi nuclear power plant, which is about to reach the maximum capacity of the storage tanks [3]. The storage tanks at the Fukushima Daiichi nuclear power plant were reaching their maximum capacity and were unable to accommodate the increasing amount of atomic wastewater that is being generated every day. The disposal of contaminated water was a choice made by Japan and the Tokyo Electric Power Company (TEPCO) on their initiative, and discharging it into the sea through pipelines is not the only way to dispose of the contaminated water. From this point of view, if it is considered that the failure to dispose of the nuclear wastewater immediately will lead to a necessity, the act of discharging the water into the sea is not the only way to counteract the situation. The discharging plan, which is a "beggar-thy-neighbor" act that transfers the risk to other countries, is likely to cause severe damage to a number of countries and even to the entire international community. Distress emphasizes the extreme danger to the life of the subject of the breach and others in their custody, as well as the uniqueness of the means. Clearly, the disposal of nuclear-contained water does not fulfill the conditions.

2.2. Japan's Discharge of Nuclear Wastewater is in Breach of Its Obligations under International Treaties

2.2.1. Obligations under United Nations Convention on the Law of the Sea

Japan is a State party to the United Nations Convention on the Law of the Sea and should comply with its obligations and fundamental principles. The actions of Japan's government violate Part XII of this convention [4]. The violation of Article 192 regulates the general obligation, which is the duty of States to safeguard and maintain the marine environment. As stated in Article 195, actions taken by states in taking measures to prevent, reduce, control the marine environment should not directly or indirectly transfer damage or hazards from one area to another [5]. The team formed by

Academician Zhang Jianmin and Associate Professor Hu Zhenzhong of Tsinghua University has established a model for the dispersion of radioactive substances after nuclear-contaminated water was discharged into the sea and has used it to make a long-term simulation prediction of the Fukushima nuclear effluent discharge plan, which shows that the nuclear-contaminated water will reach the Chinese waters in 8 months, and the coasts of North American and cover the whole of the North Pacific Ocean in 3.3 years [6]. The radioactive elements in the nuclear-contaminated water will also enter the global hydrological cycle with the combined effects of monsoon winds and ocean currents, along with ocean storms, ocean currents, and other movements, polluting the atmospheric environment, the water environment, the soil environment, the biological environment, etc., and ultimately covering the global landmass [7]. It is evident that Japan's discharge of nuclear-contaminated water into the ocean will inevitably spread to other regions and cause damage to other areas. Article 198 provides for the duty of notification of imminent or actual damage. After the accident, TEPCO was allowed to discharge nuclear-contaminated water into the ocean, and Japan did not notify the relevant countries promptly, thus seriously failing to control the risk of nuclear contamination and cooperating internationally on this issue.

Japan has also failed to effectively implement the obligations relating to environmental impact assessment and monitoring outlined in Part XII, Section 4. In terms of procedure, firstly, from the timing of the environmental assessment, the EIA must be completed before the approval of the project, and the decision shall be subject to the results of the EIA [8]. In its rulings in the *Pulp Mills on the River Uruguay (Argentina v. Uruguay)* case and the case pertaining to the construction of a road along the San Juan River in Costa Rica, the International Court of Justice (ICJ) made it clear that the state should conduct a suitable transboundary environmental impact assessment which should take into account the activities about the possible significant adverse impacts on the other state, and that the evaluation should precede the implementation or authorization of the planned measures. Japan did not explicitly publicize its technical plan and EIA report before deciding on the sea discharge plan. Although TEPCO first submitted the "Radioactive Impact Assessment Report on ALPS Treatment Water Discharge (Design Stage)" to the Atomic Energy Regulation Commission on December 21, 2021, the plan was not approved by the commission before the Japanese government adopted the sea-discharge plan, which is evident in its procedural flaws. The transboundary impact assessment obligation is characterized by continuity [9]. Once the sea discharge project starts, the state should continuously monitor and assess its hazards and impacts and implement good management and communication obligations. Regarding the verification issue, at the April 2021 Japanese Senate Resources and Energy Monitoring Session, Japan's Atomic Energy Regulation Commission also admitted that some of the inspection procedures before the official operation of APLS had been omitted due to the rush to treat the nuclear effluent. Moreover, Japan claims that the treated nuclear effluent is safe and harmless, but there is a lack of verifiable arrangements. In addition, the truthfulness of the relevant information and the transparency and openness of the process cannot be guaranteed, and the fact that TEPCO has previously covered up the harmful effects of the nuclear effluent and falsified the relevant data, as well as the fact that Japan's relevant information has been covered up by a state-specific secret, etc., has caused doubts among other countries as well as people at home and abroad.

Nuclear effluent is discharged into the sea from land through pipelines, and if it causes pollution, it is pollution from land-based sources. 207 stipulates a special obligation to prevent, reduce, and control pollution of the marine environment from land-based sources, and 213 stipulates a duty to implement. Japan's discharge must adhere to the applicable international regulations and norms; it cannot be decided upon and carried out independently.

Furthermore, the duty of notification, cooperation, and consultation is recognized in the United Nations Convention on the Law of the Sea, the Convention on Biological Diversity, the London

Convention, and other treaties. Article 198 of the United Nations Convention on the Law of the Sea provides that when a state is aware of instances where pollution is causing or has caused harm to the marine environment, it must promptly alert other states it believes will be impacted by the damage as well as the competent international organizations. Articles 200 and 201 provide the obligation to cooperate, exchange information and data, and establish scientific standards. Japan had not fully consulted and exchanged information with the most affected countries, such as the Republic of Korea, China and the Pacific Rim countries, and had failed to meet the requirements of international law.

2.2.2. Obligations under Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972

The Government of Japan has adopted the method of releasing nuclear effluent to the coast by constructing a one-kilometer submarine pipeline to circumvent the categorization of sea discharge as "dumping" for the purpose of evade the application of the London Convention. This is because the meaning of "dumping" is any deliberate disposal at sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea, and the scope of such discharges at sea does not cover discharges using pipelines [10]. Some have contended that the Convention was inapplicable to Japan's discharges though Japan's discharges violated the spirit of the London Convention on the Limitation of Waste Discharges [11]. However there is a view that the meaning of the legislator should be the determining factor in the application of the law, and that the case of *Foster & Elam v. Neilson* can be used as a reference to apply an international treaty by adopting the method of presuming the common will of the parties so that the treaty can be presumed to be binding on Japan as it can be tacitly assumed that Japan has the intention to prevent pollution of the marine environment [12]. From the viewpoint of the provisions of the Convention, Articles 1 and 2 of the Convention stipulate that each Contracting Party is responsible for exercising effective control over all sources of marine environmental pollution, and in particular, for taking all reasonable measures for the prevention of pollution of the marine environment resulting from the dumping of wastes and other matter. It is evident that nuclear-contaminated water belongs to the sources of pollution of the marine environment and that Japan, as a Contracting Party, should take timely and effective measures to prevent pollution rather than repeatedly opting for economic savings and pollution prevention. As a State party, Japan should take timely and effective measures to prevent pollution instead of repeatedly opting for economic savings at the expense of the marine environment and the interests of the people as a whole.

However, even if the London Convention may not regulate sea discharges, other international conventions and relevant international principles, such as the restrictions on land-based sources of pollution under the United Nations Convention on the Law of the Sea referred to above, may limit such discharges.

2.2.3. Obligations under the Convention on Nuclear Safety

Article 4 of the Convention on Nuclear Safety stipulates that "Each Contracting Party shall take, within the framework of its national law, the legislative, regulatory and administrative measures and other steps necessary for implementing its obligations under this Convention. "It is precisely because of the inadequacy of the system that Japan has failed to deal with nuclear accidents in a timely and appropriate manner, thus posing a nuclear threat to the surrounding countries and even to the international community [13]. Moreover, this provision reflects the requirement of the Convention on the duty of prevention, and Japan is unable to meet even the minimum standard of "due diligence" [14]. According to the Convention, Contracting Parties are required to take the necessary actions to guarantee that the safety status of existing nuclear sites is examined. The Fukushima nuclear power plant unit in Japan, on the other hand, is overage. The Japanese government should be held

accountable for the nuclear safety of this unit since it has neglected to conduct timely inspections and management [15].

2.2.4. Obligations under the Convention on Early Notification of a Nuclear Accident

Since Japan's handling of nuclear wastewater was in the aftermath of the Fukushima nuclear accident, it is within the scope of application of the Convention on Early Notification of a Nuclear Accident since it falls under its purview. Articles 2 and 7 of the Convention stipulate the notification obligations of States Parties following an accident. Accordingly, Japan should immediately notify, either directly or through the International Atomic Energy Agency, those countries and institutions that are or may be actually affected and provide appropriate information, as well as competent authorities and contact points. In fact, after the nuclear accident, Japan did not notify the IAEA and other States Parties of the specific circumstances of the accident and did not fulfill its notification obligation. Even though the Nuclear Regulatory Authority of Japan has approved the draft review of the Fukushima nuclear-contaminated water discharge plan for 2022, the timing of the notification and the specific data still fail to meet the requirements of the Convention.

3. Forms of Japan's International Responsibility

3.1. Civil Liability Mechanisms for Pollution and Hazards Arising in the Civil Nuclear Field

There is also a basic consensus in international law on the civil liability mechanism for pollution and hazards in the civil nuclear field, such as the construction and operation of nuclear power plants, which adopts a dual liability system of operator's liability and state's liability, with the operator as the main party to bear the civil liability and the state as the supplemental party. Article VII of The 1997 Vienna Convention on Civil Liability for Nuclear Damage provides that the operator of a nuclear installation shall insure against nuclear accidents in accordance with the relevant regulations of the state of registration of the installation and that the state assumes complementary liability in the event of a nuclear accident in the event that the operator is unable to pay compensation in full [16]. Article 10(c) of Convention on Third Party Liability OECD Legal Instruments in the Field of Nuclear Energy stipulates that The State Party in which the nuclear installation of the liable operator is located shall, in the event that safeguards or other financial security are not available or are insufficient to cover the compensation for damages for which the operator has been determined to be liable, ensure the reimbursement of such claims by providing the necessary funds.[17].

All the above provisions reflect that the state should share the responsibility with the operator. As nuclear contamination, as transboundary contamination, is likely to cause serious harm of a global, continuous, or even catastrophic nature, it is clear that TEPCO does not have sufficient financial means to compensate for the loss, and Japan should assume supplementary liability.

States themselves mainly promote international legal obligations and responsibilities, and the will and strength of States determine the operation of international law. Japan should return to the right path as soon as possible and continue to fulfill its obligations under international law. For example, regarding the obligation of transboundary environmental impact assessment, Japan should take measures to mitigate environmental impacts, regularly release environmental impact assessment reports and monitor subsequent actions and ongoing impacts. With regard to the obligation of international cooperation, it should cooperate with international institutions related to the risks posed by discharges, actively and transparently exchange information, and study remedial programs with countries that have legitimate concerns about the discharge incident.

3.2. Continued Duty of Performance

States themselves mainly promote international legal obligations and responsibilities, and the will and strength of States determine the operation of international law [18]. Japan should return to the right path as soon as possible and continue to fulfill its obligations in compliance with international law. For example, with regard to the obligation of transboundary environmental impact assessment, Japan should take measures to mitigate environmental impacts, issue environmental impact assessment reports on a regular basis, and monitor subsequent actions and ongoing impacts. With regard to the obligation of international cooperation, it should cooperate with international institutions related to the risks posed by discharges, actively and transparently exchange information, and study remedial programs with countries that have legitimate concerns about the discharge incident.

3.3. Cessation and Non-repetition

The International Law Commission, in its preparation of the Draft Articles on State Responsibility, has stated that the remedy (including the obligations of cessation and non-repetition) and the obligation to make reparation are on an equal footing and that treating the two, in the same way, is considered conducive to the establishment of a more equitable regime [19]. The importance of this form of liability is evident. Compensation is more focused on remedying the harm already caused. At the same time, cessation and non-repetition require that the state does not commit similar wrongful acts again and that they are preventive, avoiding greater harm in the future. The damage and effects of contamination caused by nuclear radiation will not be immediately apparent. However, they will be a long-term process. Instead of waiting for the results of the damage to become apparent, it may be more feasible and more conducive to safeguarding the rights and interests of the victimized countries to supervise the cessation of Japan's wrongful acts.

3.4. Reparation

According to the Draft Articles on Responsibility of States for Internationally Wrongful Acts, reparation includes restitution, compensation and satisfaction. Since nuclear contamination was irreversible and restitution was difficult, it should be combined with compensation. Moreover, according to Article 31, the scope of reparation for damage included any damage caused by the wrongful act of a State, including material damage and moral damage. Moreover, the damage was not limited to what had occurred and was known but could also be what was to occur and was uncertain, as in the *Naulilaa Arbitration* (Portugal v Germany), where the special arbitral tribunal established by the German and Portuguese courts had stated that Germany should be liable for all foreseeable damage. Accordingly, in order to repair the harm to the marine environment that may have resulted from nuclear contamination, Japan should pay for the costs incurred by other subjects for monitoring and prevention, as well as for the costs incurred by them for the protection of endangered marine organisms and the restoration of marine ecosystems.

4. Recommendations for Improving National Responsibility Mechanisms for Transboundary Pollution Management

4.1. Establishment and Improvement of Risk Defence Mechanisms

The principle of "prevention is better than cure", emphasized in international environmental law, was increasingly recognized. Furthermore, the state's duty of diligence required the State of Origin to take all reasonable measures to prevent significant transboundary harm or to reduce the risk of its occurrence.

Moreover, The principle of risk prevention was embodied in a number of conventions, including the United Nations Rio Declaration on Environment and Development. This shows the importance of establishing a risk prevention mechanism. To reduce the potential of transboundary pollution, the system of environmental impact assessment, authorization and monitoring should be improved to ensure that it is fully implemented before decisions are taken, and international standards should be established on the basis of appropriately retaining the autonomy of each country to ensure the effective implementation of risk prevention mechanisms. Potentially affected States should be notified and consulted in a timely manner by the state of origin. Moreover, affected States should actively exercise their legitimate rights.

4.2. Building A System of Accountability under Synergy of Interests

The key issue facing the assumption of national responsibility for transboundary environmental governance is the contradiction between the transboundary nature of public goods and the established administrative divisions [20]. For example, transboundary pollution, such as nuclear pollution, is not limited to the national boundaries of one country. Its impacts are transboundary or even global, and the corresponding responses and solutions naturally cannot be accomplished by one country's power. Often, political factors and other non-legal factors cannot be excluded from the process of law-making and implementation. The rules of State responsibility are no exception, and their formation and implementation rely on the harmonization and concentration of the will and interests of all countries. International law cannot be independent of international politics so it is necessary to deal with the relationship between internal state governance and global governance [21]. Chinese President Xi Jinping has pointed out that the blue planet we live in is connected by the ocean, and the people of all countries share the weal and woe. In pursuing their interests in the oceans, all countries need a value order based on a defined system and rules with a sense of justice and security [22]. The community of maritime destiny is conducive to the construction of such an order, thus providing a valuable conceptual basis for the construction of a system of state responsibility under the synergy of interests. Therefore, countries need to implement the concept of the community of maritime destiny, strengthen cooperation and consultation, explore peaceful ways to settle disputes, seek common goals for the governance of transboundary pollution under national responsibility, and jointly decide on and adopt relevant measures and policies, so as to find a point of balance of interests and ensure the full implementation of national responsibility. The management of Sandoz chemical spill is a good example of successful consultation and cooperation among stakeholders, shared responsibility, and resolution of contradictions between public affairs and administrative divisions. In the face of the serious pollution of the Rhine caused by urban sewage and industrial effluent, European countries finally studied and formulated a comprehensive planning and management action program for the river basin: They established an efficient inter-administrative basin-wide coordination mechanism, formed a unified monitoring system for the whole basin, and the encouragement of corporate and public participation in the management of the river basin have played a powerful role in the pollution control and ecological protection of the Rhine. It is necessary and beneficial for all countries in the world to take a global view and work together to tackle transboundary pollution.

4.3. Holding States Accountable

It is necessary to comprehensively utilize diplomatic, legal, and international cooperation and international public opinion measures to exert pressure on the corresponding countries to assume national responsibility. Suppose cross-border responsibility is pursued only through legal channels. In that case, it will face difficulties in obtaining real information and evidence, international and domestic jurisdictional barriers and enforcement problems, and interference by the big powers [23].

Taking the incident of Japan's nuclear sewage discharge as an example, Japan passed the Protection of Specific Secrets Act in 2013, according to this law, the Fukushima nuclear accident and other information on nuclear issues could be covered up on the grounds of state secrecy; if a domestic lawsuit is filed in China, the Japanese government and TEPCO can object to the application of Article 9 of China's "Immunity Law" through the "place of infringement" to limit the interpretation of the method to exclude the jurisdiction of our courts over the Japanese government, claiming sovereign immunity, so that there are certain limitations to the legal remedies [24]. Therefore, a comprehensive strategy is necessary. Moreover, the measures taken in the areas of diplomacy, State cooperation and public opinion also pave the way for legal means, such as litigation or final adjudication, to recover responsibility in the future and provide better conditions and environments for them.

5. Conclusion

The discharge of nuclear-contaminated water into the ocean by Japan presents a significant threat to human health, environmental safety, and economic development while also transferring risks to neighboring countries. This action is attributable to the state and cannot be considered exempt from liability. Moreover, it reflects deficiencies in Japan's fulfillment of its obligations under international law, constituting a violation of international agreements for which accountability is warranted. In the current context, where the notion of a maritime community is increasingly recognized, the management of transboundary pollution, including nuclear waste, should not be regarded merely as a domestic issue; it is an international matter that necessitates a collective response from all nations. It is imperative to enhance the governance framework concerning national responsibility to protect the global ecological environment better. Such improvements will facilitate the adherence to national responsibilities and obligations and protect the rightful interests and rights of international organizations and the global populace.

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