

The Impact of Japan's Discharge of Radioactive Water

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Abstract: Taking the global impact of Japan's nuclear sewage discharge as the starting point, this paper studies the harm caused by Japan's nuclear sewage flowing into the Pacific Ocean, the harm to the world's organisms, the impact on seaside workers, and investigates the harmful phenomenon of nuclear sewage to human beings. This paper is divided into four parts: the first part briefly introduces the harm of nuclear wastewater and how much nuclear wastewater needs to be discharged; the second part describes the source of nuclear wastewater in Japan; the third part summarizes the introduction literature of nuclear wastewater and the existing problems of nuclear wastewater in Japan; and the fourth part gives rise to the selfish thinking that Japan only concerns about its internal affairs. The research content of this paper mainly includes the nuclear sewage discharge incident in Japan, which caused immeasurable and serious consequences. Japan must also face consequences for its actions.

Keywords: Japan's global impact, radioactive water, discharge, risk

1. Introduction

Japan's discharge of nuclear sewage contains a large number of radioactive substances, among which the excessive amount of radioactive element strontium has aroused social concern. This phenomenon will spread the pollution to the whole earth and aggravate Marine pollution, especially causing great harm to Marine organisms. Moreover, this is an extremely selfish behavior for the ecological environment. Human beings should respect the natural environment and protect ecological civilization, which will cause harm to human health and food safety and will also have a serious impact on the contamination of seafood and seafood, especially on the health and economy of consumers and consumers. And this impact is not just a current problem, but will stay with humanity, setting in motion a deliberate "harm" to the Marine environment, perhaps in the next decade, or even centuries. At the same time when the Fukushima nuclear sewage is discharged into the sea, the harm to human beings is also obvious, radioactive substances will bring many diseases to human beings, such as acute radiation sickness, leukocyte decline and even affect fertility, and in the news, there are not a few human beings who are mutated by nuclear wastewater. Although it is impossible for any organization to accurately predict the effects of radionuclide sewage on human health and life, nuclear sewage has a very high potential to cause genetic mutations and death, and has a great negative impact on Marine life and the Marine environment, and the impact may not disappear in the short term. The discharge of nuclear sewage has also forced people who make a

living from the Marine industry to lose their jobs, and not only the Marine industry in Japan, but the Marine industry in almost all parts of the world has been affected, and even the fishermen in Fukushima are calling for the protection of the sea, not only to consider the problem in Japan, and the chain reaction will eventually lead to everyone in the world. There are also many people who are afraid of all things Japanese, and this has led to the development of many industries, like many skin care products linked to Japan, and seafood linked to Japan. Some people are even afraid to buy and drive Japanese clothes and cars, which may be exaggerated, but in this era, we all cherish our lives and are afraid of hurting ourselves and their families because of others' mistakes. Moreover, as a signatory to the United Nations Convention on the Law of the Sea, Japan has the obligation to protect and ensure that the ocean will not be polluted due to its own reasons. It is fully aware that this is a betrayal of the global protection responsibility or a willful attempt to maximize its own national interests. As a developed country, Japan should assume greater responsibilities. Instead of declaring that nuclear sewage has no impact on the world, the problem is passed on to the world's oceans. Japan's Fukushima Daiichi nuclear power plant has begun discharging into the ocean for 30 years. The expression of Japan's self-interest is to transfer the risk of pollution to the world and to all mankind and their animals and plants. The trade relationship between China and Japan plays an important role. Japan is China's fourth largest trading partner, and cooperation between China and Japan is essential, while China is Japan's largest trading partner. For the discharge of Japanese nuclear water, China intends to strengthen radiation monitoring of the collection and treatment of nuclear water and strengthen cooperation with other countries, strengthen food safety testing and so on.

2. Sources and Hazards of Nuclear Sewage in Japan

2.1. The source of nuclear wastewater

It is reported that 12 years after the 9.0 magnitude earthquake in Fukushima, Japan, on March 11, 2011, was one of the world's worst technological accidents to date, the Tokyo Electric Power Company still has no idea how to remove the melted reactor core. Highly radioactive water from the cooling of the reactor core is being produced every day. If the problem of disposal of the melted core remains unresolved, starting the discharge of contaminated water into the sea will mean a sea pollution catastrophe with no end in sight. The earthquake caused very serious damage to the Daiichi nuclear power plant in Japan. An estimated 7,800 tons of contaminated water continues to be produced as seawater cools the reactors to avoid a meltdown at the Fukushima nuclear power plant, and experts predict that it will take only 240 days to contaminate China's coastal areas.

What's more, it's no use not eating seafood if you don't want to be infected. Because of the water cycle, ocean water will evaporate to form rain and clouds, which will no longer be as white as before. Some substances will penetrate into groundwater along with rainfall, and groundwater will recharge rivers and lakes, and the final result will affect our water use. In fact, there are many ways to treat nuclear sewage, such as underground inungement, steam discharge, etc., but Japan chose the treatment result that is beneficial to itself and chose the sea discharge plan that is "short in time and low in cost". How big the eventual impact will be, including in Japan, is anyone's guess, but it is a risk too great for such harm, even if the probability is low, and should be avoided rather than gamble with the fate of the whole world's creatures. Due to the impact of the first batch of sewage discharged into the sea, the price of salt in South Korea has risen rapidly, and people are crazy to stockpile salt. And there are also some groups affected by this, began to grab the salt wave, and even some people took this incident to expand, calling on everyone to swallow salt in an emergency, not so, in Japan announced the first day of discharge of nuclear sewage, at noon on August 24, a number of online platforms of low sodium salt, non-iodized salt showed a shortage, offline

supermarkets also appeared a serious grab salt incident, there was a phenomenon of buying out. This is undoubtedly causing panic among the people. Moreover, according to the stock market information, Jiangyan Group hit the daily limit on August 26, and Su Yanjingshen, Xu Tian Salt, and China Salt Chemical Industry quickly followed. In the face of such exaggerated behavior by the masses, relevant departments have also come out to refute the rumors, and China Salt Group urgently issued a statement saying: China's current salt product structure accounts for 87% of mine salt, 10% of sea salt, 3% of lake salt, that is to say, 90% of salt production will not be affected by Japan's nuclear sewage, but only this aspect, and other aspects of the harm in the end how much no one knows.

2.2. The Harm of Nuclear Sewage to Human Beings

Japan has confused nuclear sewage with nuclear waste water, and after consulting information, nuclear contaminated water refers to water containing radioactive elements generated in the process of nuclear reaction, which may come from nuclear power plants, nuclear laboratories or nuclear waste treatment facilities. Nuclear contaminated water may have a serious impact on human health and the environment, some radioactive elements such as iodine-131, cesium-137, etc., may cause carcinogenic effects on the human body, and may also cause irreversible damage to the local ecosystem. The nuclear wastewater is a variety of low-level radioactive wastewater generated during the operation of nuclear facilities, such as equipment washing water, ground and equipment cooling water. The impact of nuclear wastewater on the environment and human health is relatively small.

However, both nuclear contaminated water and nuclear waste water should be properly treated and discharged. The news of Japan's nuclear sewage discharge is a matter involving their own safety for everyone, so it is not surprising that as soon as the news of the front foot comes out, the back foot everyone is confused. According to recent reports, only a week after the radioactive water was released, the waters of Japan have been significantly blackened, and many unidentified objects, floating bodies of turtles and small fish, have been floating in the sea, while whales, which live as a group of Marine creatures, have also announced their death to the sea. At the same time, it also proves once again that the ocean is calling for help to humans, they are constantly crying, and if it continues to deteriorate, not only they, the creatures of this world will too face disaster. Japan should and must be save the sea and give sea life a home. Because of the mistake of the Japanese side, the sea of blue sea and blue sky turned into a black bottomless pit. Japan continues to drain the sea like a bottomless pit.

If this incident does not play a decisive role at all, it can only raise questions and question issues for events that affect social problems, and pay close attention to this behavior that may lead to global risks. Japan knows that this act will lead to global harm, but it still persists in choosing to discharge nuclear sewage. This act does no harm to others, and Japan will eventually get the consequences it deserves.

So far, Japan has for the first time discharged nuclear sewage into the sea, as of now has been discharged to the sea more than 6,000 tons, but on the second day of the Japanese fishery representatives on the 21st of this month to reiterate their opposition to the discharge of nuclear sewage into the sea, Japan has forced a decision on the discharge schedule, and Tepco also announced the same day that the discharge of 3.12 million tons of "treated water" numerical targets in 2023. It can be seen that the nuclear sewage seaweed is the "established policy" of the Japanese government and Tepco, and other commitments are just delaying tactics, that is, hiding the sea, after the Japanese government announced the date of the discharge of the sea, Fukushima fishing groups have stressed that the opposition position remains unchanged. At the same time, that is to say, the

Japanese government and TEPCO have reneged on their promises. This will be followed by a second release, which is scheduled for the end of September.

3. Reference to the Legal Issues and Countermeasures of Japan's Nuclear Wastewater Discharge in the First Issue of South China Sea Law

3.1. Background

The incident dates back to the 9.0 magnitude earthquake that hit Japan a decade ago and triggered a massive tsunami that leaked massive amounts of contaminated water from the Fukushima nuclear power plant on Japan's east coast.

Japan's nuclear wastewater contains radioactive materials, once the Fukushima nuclear power plant on the east coast of Japan, radioactive materials will spread to more than half of the Pacific Ocean, resulting in seafood pollution in the surrounding sea, affecting the safety of seafood.

3.2. Potential Cause Analysis

For Japan, when a nuclear power unit has been in operation for about 30 years, it is called an "old" unit, but by the time of the accident, the nuclear power unit had actually been in operation for 40 years. Although there is no clear retirement age for nuclear power units, it is not appropriate for such super-old nuclear power units to still be used as main units.

If the nuclear power unit is operated for a long time, it is affected by radiation, heat energy, and the machinery and equipment continue to age, which may threaten the life safety of the staff.

3.3. The Japanese government then took action on the discharge and sewage

Tsunehisa Katsumata, chairman of TEPCO, said there would be no more! I am deeply sorry for the incident. But on April 13, 2021, Japan once again decided to discharge millions of tons of contaminated nuclear water from the Fukushima Daiichi nuclear power plant into the sea in two years.

The chairman of TEPCO announced that it would no longer discharge sewage into the sea, and at the same time issued a declaration confirming that nuclear sewage will not cause harm to human beings and the environment, which is extremely irresponsible behavior to mankind.

3.4. The Seriousness of the Transfer of Pollutants to the Ocean

Before the disaster came, relevant experts had analyzed the index and probability of the Fukushima nuclear power plant's ability to withstand the disaster, but they were ignored again, from which they could not see Japan's belief in fulfilling its nuclear safety obligations.

Japan's deliberate distortion of nuclear waste water has no effect on humans at all, and this move to the sea is particularly serious, possibly causing death, mutation and genetic mutation of Marine life.

In an article published in the Proceedings of the National Academy of Sciences, US scientists reported that radioactive materials released into the ocean by the Fukushima nuclear accident were detected in bluefin tuna caught off the coast of California

Samples of bluefin tuna were found to contain 10 times the amount of radioactive cesium 134 and cesium 137 found in similar fish.

On April 13, 2021, despite doubts and opposition at home and abroad, the Japanese government unilaterally decided to discharge Fukushima nuclear wastewater into the sea after full consultation with neighboring countries and the international community. The drainage plan is expected to start in 2023 and last for 20 to 30 years. Such irresponsible action by the Japanese side will seriously

damage international public health and security and the vital interests of people in neighboring countries, and arouse strong opposition from the international community, especially neighboring countries. [1]The South Korean Foreign Ministry summoned the Japanese representative to express a strong protest [2]. The spokesperson of our government's Ministry of Foreign Affairs objected [3]. The Russian Ministry of Foreign Affairs also expressed serious concern [4].

Fukushima nuclear contaminated water discharged into the sea has a cross-border impact, with a study by the German Marine agency showing that relevant radioactive materials can spread to most of the Pacific Ocean within 57 days from the date of discharge, and seriously spread to the global sea ten years later. Many countries are closely following Japan's actions and hope that Japan can fully cooperate and share information with the international community to ensure that there is no risk to the environment and human health.[5]

Citing Science Bulletin, Vol. 66, No. 35, 2022, it is reported that the Fukushima nuclear accident in Japan was triggered by a tsunami that struck a magnitude 9 earthquake on the bottom of the Pacific Ocean. After this event, a large number of radioactive elements were exposed to our environment for a long time, and affected the living environment everywhere in many ways.[6]

Quoting a report written by the School of Oceanography of Guangxi University, it can be seen that the phenomenon of Fukushima discharging nuclear wastewater will have a certain impact on China, and nuclear wastewater also contains a variety of artificial radionuclides, which have a great impact on the human body.[7]

Citing the National Marine Environmental Monitoring Center, it is written that there are two main sources of Fukushima's nuclear wastewater, on the one hand, nuclear fuel has been in the reactor, and Dongdian needs to continuously inject cooling water to take away the heat generated by nuclear decay in the core and prevent further melting and leakage of nuclear fuel.[8]

Citation, State Key Laboratory of Marine Environmental Sciences, Xiamen University. The article lists a variety of nuclides, and it is written that before the implementation of the Fukushima nuclear wastewater discharge plan, this part of the Fukushima nuclear wastewater still needs to be retreated with ALPS to further reduce the nuclide concentration to meet the discharge concentration limit requirements.[9]

Cited by the Institute of Japanese Studies, Chinese Academy of Social Sciences. The article writes that shortly after the Fukushima nuclear accident, experts and industry insiders warned that nuclear wastewater disposal would become the biggest problem in the accident.[10]

In order to ease the growing storage pressure of nuclear waste water, Japan officially passed the bill in April to discharge nuclear waste water, but how to spread and the severity of the consequences, and whether there will be a concentration of radioactive materials during this period has not been 100% confirmed.[11]

3.5. Japan leaves room for debate

Japan has been in denial about whether nuclear waste will cause damage to the global Marine ecology, insisting that nuclear waste is within the scope of safety standards and does not pose any threat to the ocean. However, there is evidence that prolonged exposure to radioactive materials can cause acute radiation symptoms, such as nausea and vomiting. Therefore, Japan's claim that the discharge of nuclear wastewater into the sea will not affect the global Marine life is not reliable.

Gradually polluting the global ecological environment, causing serious damage to other countries, and eventually entering the human body, endangering human health. The harm of nuclear sewage to human body will cause cancer, lead to gene mutation and cardiovascular and cerebrovascular diseases, arthritis and so on. Radioactive elements have been detected in grouper fish caught near the Fukushima nuclear power plant in Japan, which could be dangerous for human consumption. A Russian biological doctor said that even if the nuclear water from the Fukushima

nuclear power plant is diluted, it will pollute fish and accumulate in the human body as long as it is discharged into the sea. We live in nature, grow in nature, explore nature as we grow, and yet wantonly destroy it. The future of the world should be in the hands of all countries, international rules should be written by all countries, global affairs should be contributed by all countries, and the fruits of development should be shared by all countries. Japan is doing a lot of damage to the world. Japan is dumping radioactive water into the Pacific Ocean, which is connected by oceans, and the radiation hazard will spread over much of the Pacific. Radioactive substances are not only transmitted on the surface of the contact will lead to disease, it can also enter the human body through the food chain, air and other ways, radioactive substances bring harm to people's health, pollution to the Marine environment and Marine life, and even bring food safety problems to the world. When it comes to food safety, seafood will come to mind, and the discharge of nuclear wastewater will inevitably be contaminated by radiation and further consequences are unimaginable. Radioactive materials can also damage genetic material, causing genetic mutations and chromosomal aberrations that can affect one or even several generations. On the surface, Japan announced that the nuclear sewage has been treated and called the nuclear sewage treatment water, in fact, has been concealing the harm of nuclear sewage, no matter how Japan calls the Fukushima nuclear sewage, its radioactive material will not disappear. As a party and a bystander of this incident, I have no real power and substantive research, which can only inform this incident. Japan will be discharged nuclear sewage has been too much to recover, no matter how to change it can not change the fact that nuclear sewage affects human beings and all living things on the earth, and has suffered heavy losses. Nuclear sewage discharged into the sea, Japan no matter how to beautify it is just to cover up. When ecology prospers, civilization prospers, while when ecology falters, civilization falters. We should call for the protection of the ocean and be the protectors of the environment. This is our home, and the ocean is an essential part of it. The ocean is the world's ocean, not Japan's sewer. We need to build a strong sense of human community and work together to shoulder our responsibilities and tide over difficulties. Only by doing so can we make the world a better place and bring happiness to our people. The discharge of nuclear sewage into the sea is not a matter of one country, and the behavior of Japan is like not climbing a high mountain, not knowing the sky is high; Rather than a deep valley, Japan's first concern is not the legitimate concerns of its neighbors and international public interests, but how to minimize its own burden. In the final analysis, this is an extremely selfish and irresponsible state behavior. If it continues to do so, Japan will be permanently branded as a scourge on the Marine environment.

4. Conclusion

With the rapid development of the world, the world has also ushered in different challenges and risks, and protecting the world environment has an increasingly important role and significance. When Japan discharged nuclear sewage, it still insisted on discharging nuclear sewage despite the obstruction of any country, and Japan did not pay attention to the problems of the world. They just solve their own problems. The professional knowledge at this stage is relatively general, and the collection method used in this paper is not very difficult, and the current view may not be analyzed thoroughly enough.

References

- [1] *Nankai Law Journal No. 1: Research on legal issues and countermeasures for nuclear wastewater discharge in Japan.*
- [2] *American scientists published articles in the Proceedings of the National Academy of Sciences.*
- [3] *Pan Kun. (2021) Beijing Institute of Technology, Qingdao Municipal Committee Party School, Journal of Qingdao Administrative College, Issue 6*

- [4] Jin Huan. (2021) *Contemporary World*, Research Fellow, Institute of Japanese Studies, Chinese Academy of Social Sciences, No. 6
- [5] Wuhui Lin *Chinese Science Bulletin*. (2021) No. 1, 66, No. 35: 4500-4509.
- [6] Kefu Yu Key Laboratory of Coral Reef Research in the South China Sea, College of Oceanography, Guangxi University.
- [7] Jinqiu Du *China Science Bulletin National Marine Environmental Monitoring Center, Dalian*. (2021) No. 1, No. 66, No. 35: 4500-4509 Dalian 116023
- [8] Hongyang Lin State Key Laboratory of Offshore Marine Environmental Science, Xiamen University, *Science Bulletin of China*, No. 36 No. 35: 4500-4509, No. 1, Xiamen 3611022021, China
- [9] Wen Yu *Chinese Science Bulletin*, School of National Security and Emergency Management, Beijing Normal University, Zhuhai 519087, 2021, Vol. 1, 66, No. 35: 4500-4509
- [10] Minting Mo Quoted in Tokyo, August 24 (Xinhua).
- [11] Shenzhen International Graduate School, Tsinghua University 2021.12.01