IAEA
Atoms for Peace and Development

Information Circular

INFCIRC/1113
Date: 27 July 2023

General Distribution
Original: English

Communication dated 26 July 2023 received from the Permanent Missions of the People's Republic of China and the Russian Federation to the Agency

1. The Secretariat has received a letter dated 26 July 2023 from the Permanent Missions of the People's Republic of China and the Russian Federation to the Agency.

2. As requested, the letter and its attachment are herewith circulated for the information of all Member States.

H.E. Mr. Rafael Mariano Grossi
Director General
International Atomic Energy Agency
Vienna

Vienna, 26 July 2023

Dear Director General,

We have the honour to inform Your Excellency that the People's Republic of China and the Russian Federation prepared the Third Joint List of Technical Questions by the People's Republic of China and the Russian Federation on the Disposal of the Japanese Fukushima Nuclear Contaminated Water, and kindly request the Secretariat of the IAEA to circulate this letter with the attachment as an Information Circular (INFCIRC) for information of all Member States.

Accept, Excellency, the assurances of our highest consideration.

LI Song
Ambassador Extraordinary and
Plenipotentiary and
Permanent Representative of the
People's Republic of China to the
United Nations and other International
Organizations in Vienna

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The Third Joint List of Technical Questions by the People's Republic of China and the Russian Federation on the Disposal of the Japanese Fukushima Nuclear Contaminated Water

After thorough study, we found that most answers from *Japan's Response to the Feedback from the People's Republic of China and the Russian Federation Concerning the Joint Technical Questions* dated May 3 (INFCIRC/1084) still did not address our questions directly. Japan did not adequately respond to the following questions: the demonstration of the disposal plan for the nuclear contaminated water is insufficient; legitimate concerns of stakeholders are ignored; the assessment of long-term marine ecological impacts is deliberately evaded, etc. We hope that Japan shall earnestly fulfill its national responsibilities and international obligations, fully consult with stakeholders including neighboring countries and relevant international organizations, dispose of the nuclear contaminated water in the safest and most appropriate manner under strict international supervision, without undermining the global marine environment and the common interests of all mankind.

I. Questions Concerning the Disposal of the Nuclear Contaminated Water

[Question 1]

In response to the question we raised, *"The Japanese side stated that the storage tanks in which the nuclear contaminated water is currently stored occupy a vast amount of space, and dismantling the tanks is to construct facilities which temporarily store the removed fuel debris, these reasons are completely untenable. There is sufficient land space around the Fukushima Daiichi Nuclear Power Station (FDNPS) for the construction of decommissioned waste storage facilities. The Japanese government should do its best to solve the problem within its own territory, and should not transfer the risk of nuclear contaminated water to the ocean, which is the common wealth of human society, and to stakeholders including neighboring countries"*, Japan did not answer this question

directly, but still argued that the decommissioning requires a lot of space and it needs to build storage facilities for removed fuel debris and other items. It also argued that even if there were sufficient space to build storage tanks outside the Fukushima Daiichi Nuclear Power Station, it needs to find ways to handle the ALPS treated water. This reply fully revealed Japan's intention to push forward the implementation of ocean discharge plan.

On the one hand, Japan claimed that *"the ALPS treated water"* was *"drinkable"*, so that it would not transfer the risk to the world. On the other hand, it also acknowledged the risk exists in transporting *"the ALPS treated water"*. The two expressions were self-contradictory. Japan replied that *"Discharging water that meets regulatory standards into the sea is a normal practice conducted by many countries around the world. "*, and quoted Japan's *Basic Policy on Handling of ALPS Treated Water at the TEPCO's Fukushima Daiichi Nuclear Power Station* to support this statement, which is a disguised replacement of concept. Japan's so-called *"ALPS treated water"* is the product of water contaminated by nuclear accident and contains a large number of nuclides not found in normal operation of nuclear power plants, including long-lived radionuclides. It cannot be discharged into the ocean shared by mankind simply because it is recognized as *"water that meets regulatory standards"* under Japan's policy and regulations .

[Question 2]

In the explanation to the second question, Japan mentioned that one of the reasons why it did not choose vapor release was that it was difficult to monitor under this discharge mode. But in fact, at present, there are mature monitoring methods for tritium in airborne effluents, and it is not difficult to monitor tritium release. Japan's claim that *"the ocean discharge can be implemented more reliably, with respect to mitigating environmental and human health impacts."* is unfounded. Japan did not explain why ocean discharge is more reliable than other method and why its impact on environment and human health is less, which is unconvincing. In particular, compared with the method of ocean discharge, vapor release has less impact on the ocean and neighboring countries, and ocean discharge is more likely to cause illegal discharge or leakage, resulting in environmental pollution.

Japan also mentioned that *"Facility configuration for discharge into the sea is simple comparing to that for vapor release. "*, which shows that Japan chooses ocean discharge based on economic considerations. In addition, the *Tritiated Water Task Force Report*

released by Japan in June 2016 compared the economic benefits of different disposal modes for the nuclear contaminated water: ocean discharge costs only 3.4 billion yen, which is one tenth of the cost of vapor release. It is quite clear that Japan's choice of ocean discharge is largely based on the consideration of economic cost, which is most favorable to Japan, but not so to its neighboring countries and other stakeholders. Japan's practice of putting its own economic interests first is unfair to other countries and the international community.

In part 3 of its answer to the second question, Japan mentioned that *"Discharging into the sea is the international practice widely adopted by other countries as an option for the disposal of liquid waste from nuclear facilities."* It should be pointed out here that the *"international practice"* is for liquid waste released during the normal operation of nuclear power plant, while Japan intends to discharge radioactive contaminated water from a nuclear accident. The two are of different sources and compositions. The two terms should not be confused.

In addition, normal discharge is carried out with dual control of the total amount and concentration of nuclides during normal operation of nuclear facilities, rather than dilution discharge currently adopted by Japan. In Japan's current dilution discharge plan, tritium needs about 100 times seawater for dilution to meet the concentration standard for discharge. At the same time, there is no total discharge limit set for nuclides except for tritium.

[Question 3]

According to the implementation plan for the ocean discharge issued by Japan on November 14, 2022, Japan only carried out tests on the secondary treatment effect of 2000m^3 contaminated water not meeting the standard. The amount of water in the test is only equivalent to that of two storage tanks, and only accounts for 0.15% of the existing 1.33 million m^3 of the contaminated water in storage. However, there is no international precedent to follow for the disposal of nuclear contaminated water from nuclear accidents with such a large amount, so complex composition and so many kinds of radionuclides. Therefore, Japan's verification tests are insufficient.

With regard to the transfer of re-purified water in storage tanks to relevant facilities for measurement and confirmation, Japan provide detailed handling procedures if it is found

not meeting regulatory standards.

[Question 4]

Japan's current answer related to "early warning level of monitoring" only involved environmental monitoring (sea area monitoring). It is necessary to establish early warning system in the following four aspects: inlet of ALPS (or outlet of pretreatment systems of contaminated water), outlet of ALPS, the measurement/confirmation facility and the discharge vertical shaft, and the environment. More detailed explanations of issues related to "early warning level of monitoring" are needed, such as radionuclides selected for warning, explicit warning value of specific radionuclides (not a qualitative description such as baseline level), measurement method and how its detection limit fit for the warning purpose, and interventions in case of warning. In addition, with regard to the monitoring of seven major radionuclides (Cs-134, Cs-137, Co-60, Ru-106, Sb-125, Sr-90 and I-129) before discharge, TEPCO has been measuring weekly the concentration ratios of seven major radionuclides to total α and total β at the entrance and the exit of the ALPS facility. Please explain the significance of such measurement, the influence of uncertainty and the application of such ratio results.

[Question 5]

In the Japanese homogenization test, it is inadequate to only select trisodium phosphate as the reagent to verify the homogenization. Two or three typical reagents shall be selected for the homogenization test according to the types and properties of impurities in actual water samples. Because different types and properties of impurities will affect the homogenization effect. Japan shall provide more sufficient evidence to prove the effect of homogenization.

[Question 8 & 9]

Questions 8 and 9 are mainly about the credibility of the monitoring results.

The ocean discharge is by no means a private matter for Japan itself. The water to be discharged is the nuclear contaminated water arising from a severe nuclear accident, therefore the discharge plan has caused widespread concerns in the international community. In case the ocean discharge is really implemented, it is necessary to invite an international third party to participate in the monitoring activities in order to ensure transparency and credibility.

In its reply, Japan did not explain the basis for the measurement and the quality assurance procedures, which is a prerequisite to ensure the credibility of monitoring results. Japan shall provide the basis and quality assurance procedures for the measurement methods of all nuclides contained in the nuclear contaminated water. Japan replied that the quality assurance of monitoring is conducted by TEPCO and the GOJ, and if necessary, the confirmation and advice will be provided by NRA. Without external supervision, its credibility cannot be ensured.

In response to the question we raised, *"The Japanese side should further explain the quality assurance procedures supporting the monitoring plan and the plan to conduct supervisory monitoring. The Japanese side should invite stakeholders including neighboring countries to sample and monitor the nuclear contaminated water as well as the sea areas where it is discharged"*, Japan replied that *"As for the monitoring conducted by Japan, a system has been put in place whereby various domestic organizations (relevant ministries, local governments, and TEPCO) work together to conduct monitoring."* Japan did not directly answer our question.

[Question 10]

Japan believes that *"international experts in the IAEA Task Force (TF) include Chinese and Russian experts"* equals to inviting stakeholders including neighboring countries to carry out assessment, whole-process supervision and independent supervision. Both Chinese and Russian experts participate in the TF as individuals and independent international experts. Obviously, these experts do not represent their own countries, and their participation in the IAEA's review does not equal to China and Russia's participation in the review. Their work only involves the technical review of whether the Basic Policy of the Japanese government in handling of "ALPS treated water" conforms to the IAEA safety standards. The review of the TF and that of the stakeholders are different in terms of their starting points, decision-making considerations, the scope of review, content of work and positions, etc. In addition, the TF review of the pre-phase of ocean discharge does not guarantee that the subsequent implementation by Japan will be fully in accordance with the existing plan, and cannot allay the concerns of stakeholders. Therefore, we believe that the TF review and assessment cannot substitute the whole process monitoring by stakeholders.

In accordance with the *United Nations Convention on the Law of the Sea* and the safety

standards of the IAEA, stakeholders including neighboring countries should play a role in reviewing Japan's ocean discharge activities. The specific terms are as follows:

(1) Article 194 of *the United Nations Convention on the Law of the Sea* provides that 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. Article 207 also provides that contracting States shall take measures to prevent and control the discharge of hazardous substances so as to bring them in line with the provisions of the Convention.

(2) Paragraph 5.99 of the IAEA GSG-9 provides that because the regulatory control of radioactive discharges takes into account both operational and societal aspects, such as radioactive waste management in the facility and the optimization of the level of protection of the public, there are a number of different interested parties whose views shall be considered, as appropriate. A process resulting in the granting of an authorization for discharges is likely to necessitate an exchange of information between the regulatory body, the applicant and other interested parties. Some interested parties may be located in other States, especially in neighboring States.

(3) IAEA GSR Part3 3.124 provides that when a source within a practice could cause public exposure outside the territory or other area under the jurisdiction or control of the State in which the source is located, the government or the regulatory body: (a) shall ensure that the assessment for radiological impacts includes those impacts outside the territory or other area under the jurisdiction or control of the State; (b) shall, to the extent possible, establish requirements for the control of discharges; (c) shall arrange with the affected State the means for the exchange of information and consultations, as appropriate.

In accordance with the above provisions, stakeholders shall be involved in the whole monitoring process of the ocean discharge of Fukushima nuclear contaminated water, and Japan shall exchange information and consult with stakeholders in the whole process. However, Japan does not allow the most possible directly-affected neighbors and the most relevant parties (China and Russia), to participate in any international third-party

monitoring mechanism.

On the other hand, the monitoring conducted by the IAEA mentioned in Japan's answers is carried out according to scope and requirements of a specific IAEA review mission. Only a small amount of samples were collected and measured in the review as compared to the 30-year discharge. Assuming that Japan does implement the ocean discharge, taking into account that the entire process may last 30 years, and taking into account the TEPCO's history of data-tampering, it is necessary to establish a long-term monitoring mechanism with the direct participation of stakeholders (such as China, Russia, South Korea, Pacific island countries, etc.), which shall cover the entire discharge period.

[Question 12]

In its reply, Japan only depicts the limit of Cs-137 detected by radiation monitors. The following questions shall be depicted in details to show the function of the monitors as a warning: what are the limits detected for other types of nuclides? Which nuclides are controlled for activity concentration when the activity concentrations of nuclides in the nuclear contaminated water may exceed specified limits? What are the specified limits for these nuclides? Can the monitors used to detect these nuclides meet the requirements to effectively prevent accidental discharge of the nuclear contaminated water beyond the limits?

[Question 13]

In response to the question we raised, *"The Japanese side did not fully answer this question. For example, there was no adequate response to the questions on the supervision department of the implementation of the monitoring programme, and verification of the implementation of the monitoring programme by stakeholders and neighboring countries. At the same time, the types of nuclides monitored by Japan for seawater, sediments and aquatic organisms are insufficient, which do not fully cover the nuclides of concern in the nuclear contaminated water"*, Japan only replied that *"the Monitoring Plan ... is conducted by relevant ministries, local governments, and TEPCO in cooperation with each other"*, and did not clearly answer the questions on *"the supervision department and the verification by stakeholders and neighboring countries"*, nor did it answer the question of *"the types of nuclides monitored by Japan for seawater, sediments and aquatic organisms are insufficient, which do not fully cover the nuclides of*

concern in the nuclear contaminated water ".

In addition, does the monitoring of aquatic organisms include main indicator organisms? Are the same types of indicator organisms being continuously monitored? Continuous monitoring of the same types of indicator organisms can provide information on changes over time.

According to the *Radiological Environmental Impact Assessment Report* (REIA) released by Japan in February 2023, the key nuclides representing significant impacts on humans are I-129 and C-14. Guidelines should be provided for sources, emissions and environmental monitoring in the REIA. However, are these key nuclides (I-129 and C-14) explicitly monitored in the current monitoring plan (especially for environmental monitoring)?

Regarding the answer of *"an experts meeting was established for sea area monitoring ... with the mandate to provide confirmation..."*, are the members of this experts meeting all from Japan and are there any international experts involved? Can this experts meeting truly provide confirmation?

[Question 14]

In response to the question we raised, *"As for whether the key samples will be retained and adopted for remeasuring by international agencies, stakeholders and neighboring countries, Japan did not answer the question directly and should make clear explanation on that. If yes, please specify the plan and its implementation; if not, please provide the reasons."*, Japan just briefly explained how its samples are measured, stored, and disposed of, but did not directly answer whether the key samples are subject to re-measurement with the participation of stakeholders and neighboring countries.

[Question 15]

In response to the question we raised, *"In consideration of the safety of waste storage and management, please specify the methods, options and plans of the final waste disposal. How to prevent leakage so as to refrain from any impact on the Pacific Ocean and neighboring countries?"*, Japan did not provide a clear response to its specific method, approach and plan, and Japan replied *"As for the disposal of radioactive waste, it is necessary to understand the overall picture of the waste..."*, which indicates that Japan has no understanding of the overall situation of the waste to be generated in the future as

well as the overall situation of the nuclear contaminated water, thus leading to these questions on how to ensure the safe storage and management of the waste and how to ensure the disposal of the waste in line with international standards. This further raises our concern about Japan's ocean discharge plan.

The term *"leakage"* in our question refers to the leakage related to the nuclear contaminated water storage tanks, treated water storage tanks and ALPS-related facilities. Has Japan conducted an accident analysis in this regard and what are the details? How will the risk of leakage be prevented?

[Question 16]

In response to the question we raised, *"The Japanese side should provide further details of the test methods and quality assurance measures for the impervious performance of the frozen soil wall."*, Japan just briefly explained the measures for temperature monitoring and flow blocking, but did not provide any explanation to verify the effectiveness of these measures.

II. Questions about Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Ocean

[Question 2]

In response to the question we raised, *"The Japanese side should take full account of the opinions of neighboring countries and other stakeholders and enable them to participate in the relevant decision-making process."*, Japan provided explanations such as *"...provided explanations at various international conferences including..."* and *"Japan also provided a number of opportunities for individual briefings to interested countries and regions"*. This simply indicates its "information disclosure" , as well as its efforts to explain its intention to discharge the nuclear contaminated water into the ocean, without truly taking into account the objections of stakeholders and neighboring countries to its ocean discharge plan, nor directly answering how neighboring countries and other stakeholders can truly exert influence in its decision-making.

Japan has repeated that the water to be discharged into the ocean is *"ALPS treated water", not "contaminated water"*, and *"these two terms should not be mixed up"*. However, the term of "ALPS treated water" is a specific term invented by Japan itself and is not an internationally recognized term.

[Question 5]

Japan shall provide additional information on the results of the diffusion of adsorbed nuclides and their impact on seafood, especially migratory marine organisms.

[Question 6]

Japan, in its answer, qualitatively described that *"people are not expected to be in the vicinity of the water outlet at all times"*, *"it is unlikely that people would eat only fish caught nearby the outlet"*, and *"the tritium concentration at the outlet cannot be the basis for assessing radiological impact"*.

The above questions shall be quantitatively explained. For example, based on conservative and reasonable assumptions, analyze activities near the discharge outlet to get the quantitative dose distribution data over a certain area.

[Question 8]

In response to the question we raised, *"If the concentration limit can be met by dilution, then what is the point for setting the limit of annual discharge amount?"*, Japan provided the following reply: *"Japan has set the limits for tritium both in terms of concentration and annual discharge amount. In order to minimize the impact on the surrounding environment and the reputational damage, Japan has set not only the tritium concentration (1,500 Bq/L) for the discharge but also the total annual tritium discharge to keep the annual discharge below the pre-accident controlled discharge level (22 TBq/year) at the FDNPS. While the IAEA stated that this level is extremely conservative and suggested that Japan consider raising the total annual discharge limit after conducting an optimization study, Japan's policy is intentionally setting extremely conservative level in order to minimize all negative risks."* What is the basis for these extremely conservative statements? It does not make any scientific sense for Japan to place too much emphasis on tritium, without taking into account setting limits for other nuclides that have greater impact on the environment and human health.

In its reply, Japan stated that *"regulatory standards are based on the sum of the radiation effects of all nuclides, regardless of whether the reactor has experienced an accident or it is in normal operation. Under international standards, it is assessed based on whether the total dose limit (e.g., 1 mSv/year) is satisfied regardless of type of radionuclides."*

According to the safety standards of the IAEA, the radiation protection of radiation sources under planned exposure situation shall be optimized (dose constraint). The inventory shall be controlled for all nuclides (at least for the key nuclides assessed for their environmental impact).

Japan' s statement that *"The claim that contaminated water generated by the nuclear accident is different from water discharged from a nuclear power plant under normal operation is not based on scientific evidence"* is a false statement. The contaminated water from a nuclear accident differs significantly from the water discharged from a nuclear power plant under normal operation in terms of both the source and composition.

As for the source, the Japanese Fukushima nuclear contaminated water is generated from the seawater and freshwater used to cool the crippled reactors and the groundwater and rainwater in contact with the reactor core in the process of accident management. Especially, since the Fukushima Daiichii Nuclear Power Station is located in a site rich in groundwater, a large amount of groundwater flowed into the reactor building and mixed with the cooling water and fuel residues to form the nuclear contaminated water with a high level of radioactivity, a complex composition of nuclides, a high level of salt and a certain level of oil.

As for the composition, the Japanese Fukushima nuclear contaminated water contains 64 radionuclides, including 58 fission products and 6 activation products, and the main nuclides such as H-3, C-14, Cs-134, Cs-137, Co-60, Mn-54, Sb-125, Ru-106, Sr-90, Tc-99, I-129 and Rh-106. In contrast, the water discharged from nuclear power plants under normal operation mainly contains H-3, C-14, Co-60, Mn-54 and F-55. Though Japan has treated the nuclear contaminated water with ALPS facility and claimed to decontaminate the radionuclides except tritium to the level below the limit set by Japan, it is impossible that all these nuclides have been removed completely. It is obvious that the water discharged into the ocean by Japan contains the radionuclides not found in conventional nuclear power plants, especially long-lived radionuclides.

The biggest problem with Japan's choice to discharge the nuclear contaminated water from Fukushima nuclear accident into the ocean is the discharge of radionuclides that are not present in conventional nuclear power plants. This is extremely unfair to the rest of the world and is detrimental to the development of the world's nuclear industry.

[Questions 9, 10, 11]

Japan did not provide a clear response to the questions we raised, such as "*The Japanese side did not conduct risk assessment on the combined exposure toxicity of radionuclides and other contaminants, and on the long-term health effects caused by Auger electrons of tritium and carbon-14. Japan did not explain the methodology and results of the assessment on the enrichment of radionuclides in certain foods and their long-term health effects caused by biological chain transfer following the discharge of nuclear contaminated water.*

[Question 12]

Japan claimed that the *Radiological Environmental Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea* (Construction stage / Revised version) has gone through the public comment process. The Reference E of the Report stated that *"After the publication of this report on November 17, 2021, we received 400 or more opinions from both inside and outside of Japan in response to our Public Comment Procedure. ... We have revised the contents of the report in April 2022, by taking into account the public comments..."*. However, it did not specify whether there were any public objections or how Japan responded to and dealt with them. In addition, the report did not specify the scope of public comment. We request Japan to provide a detailed explanation on this.

[Question 19]

We request Japan to provide additional information on whether there are water masses with locally elevated level of radionuclides (non-adsorbed and adsorbed nuclides).

[Question 20]

It is the responsibility of Japan to prepare an assessment plan in a scientific and objective manner, and the IAEA review shall not be used as a pretext. TEPCO has had many cases of dishonesty in falsifying data. Japan's plan to discharge the nuclear contaminated water into the ocean is the first time in world history. Can the funding and team leader of such an important assessment be undertaken by a company like TEPCO, which has a disgraceful record and is anxious to implement ocean discharge plan? Can this approach ensure that the assessment report is prepared in a scientific and objective manner?

Japan did not explicitly respond to the question of why independent third parties were not invited to conduct relevant assessment, nor did it respond to the question of China and Russia participating in third-party assessment as stakeholders. We reiterate once again that the presence of experts from China and Russia in the IAEA Task Force does not necessarily mean that China and Russia have participated in third-party assessment. We continue to insist that China and Russia, as stakeholders, shall participate in third-party assessment.