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Communication dated 20 July 2022 received from the Permanent Mission of Japan to the Agency

1. The Secretariat has received a Note Verbale dated 20 July 2022, together with an attachment, from the Permanent Mission of Japan to the Agency.

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

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NOTE VERBALE

The Permanent Mission of Japan to the International Organizations in Vienna presents its compliments to the Secretariat of the International Atomic Energy Agency and has the honour to convey as attached Japan's response to the questions from the People's Republic of China and the Russian Federation concedrning the handling of the ALPS treated water at the Fukushima Daiichi Nuclear Power Station, which were contained in INFCIRC/995.

In this regard, the Permanent Mission of Japan requests the Secretariat to circulate this Note with the attachment as an Information Circular (INFCIRC) to all Member States.

The Permanent Mission of Japan to the International Organizations in Vienna avails itself of this opportunity to renew to the International Atomic Energy Agency the assurances of its highest consideration.

20 Juy 2022
Vienna
To the Secretariat of the
International Atomic Energy Agency

Japan's Response to the Questions from the People's Republic of China and the Russian Federation

I. Questions about "Nuclear Contaminated Water" Disposal

[Question 1]

- *Is the "Basic Policy on the Handling of Advanced Liquid Processing System (ALPS) Treated Water from the Fukushima Daiichi Nuclear Power Station" set by Tokyo Electric Power Company Holdings, Inc. (TEPCO) and the Ministry of Economy, Trade and Industry of Japan about disposal plan of the nuclear contaminated water in 30 to 40 years, consistent with the Decommissioning Project (the Road-map) of Units 1 to 4?*

[Japan's Answer 1]

- Yes: The ALPS treated water disposal based on the Basic Policy is consistent with the "Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's FDNPS"[1] (hereinafter referred to as the "Roadmap"). However, this question is framed in terms that suggest a factual misunderstanding. The water to be discharged from Tokyo Electric Power Company Holdings (TEPCO)'s Fukushima Daiichi Nuclear Power Station (FDNPS) is not "nuclear contaminated water". Rather, it is "ALPS treated water" that has been purified to below regulatory standards set based on the recommendations of International Commission on Radiological Protection (ICRP) for radionuclides other than tritium, and then further diluted to a level far below the regulatory standards for safety for all radioactive materials, including tritium.
- The fundamental principle underlying the Roadmap is to balance reconstruction of Fukushima Prefecture with decommissioning of FDNPS. In order to proceed with the decommissioning in a planned manner, TEPCO will now move on to the extremely challenging task of removing high-level radioactive materials such as fuel debris, on the basis of the Roadmap. In order to safely store the removed fuel debris and equipment such as extraction devices, it is necessary to establish facilities to temporarily store these items and to store waste materials that will be generated in the future. This requires a vast amount of space. In addition, prior to the construction of these facilities, it will be necessary to dispose of the ALPS treated water and to dismantle the tanks in which the ALPS treated water is currently stored. In light of the time required for the

[1] The Inter-Ministerial Council for Contaminated Water and Decommissioning Issues (27 December 2019) "Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station", available at:
<https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20191227_3.pdf>

dismantling and removal of the tanks and the construction of the related facilities, the disposal of the ALPS treated water is required to start at the earliest possible stage.

- Based on these circumstances, as detailed in the response to Question I-2, in April 2021, the Government of Japan (GOJ) has announced the "Basic Policy," which includes the selection of discharge into the sea as the method of discharge of ALPS treated water. The ALPS treated water based on the Basic Policy will be disposed as part of the decommissioning work under the policy in the Roadmap, and is consistent with the Roadmap.

[Question 2]

- *Please explain the decision-making procedure of the disposal plan of the nuclear contaminated water, from the comparison and selection to final determination and the judgement basis for choosing the discharge of nuclear contaminated water into the sea as the best disposal option. If the Japanese side believes the treated nuclear contaminated water is safe, why not discharge it within Japan's own territory? Will the Japanese side analyse other technical options of the treatment of the nuclear contaminated water?*

[Japan's Answer 2]

- The discharge is planned to take place in Japan's territorial sea.
- Japan has evaluated other technical options for the disposal of the ALPS treated water and found them less satisfactory than discharge into the sea. The option to dilute and discharge the ALPS treated water assumes dilution using sea water and then discharging into the sea rather than on to Japan's land territory. The latter option would require transportation of a large volume of non-diluted treated water, which would bear the risks of leakage and other accidents. Many countries around the world, including the People's Republic of China and the Russian Federation, discharge radioactive waste from nuclear power plants into the sea under their own national standards, and in line with international standards. The ALPS treated water will be discharged into Japan's territorial waters in a manner that ensures compliance with Japanese domestic regulatory standards in line with international standards. TEPCO and METI have conducted extensive ocean dispersion modeling in accordance with one of the international best practices to simulate the behavior of the ALPS treated water once discharged into the sea. These models, which were reviewed by the IAEA, demonstrated that concentrations of tritium above natural background concentrations will be limited to within 3 km^2 of the discharge point at FDNPS.[2]
- Japanese experts conducted comprehensive discussions on this matter over a period of more than six years at the Tritiated Water Task Force and Subcommittee on Handling of ALPS treated water (hereinafter referred to as the "ALPS Subcommittee"). The ALPS Subcommittee was comprised of technical experts from outside of the GOJ[3].

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[2] See Section 6-1-3 of TEPCO's Revised REIA Report for further details of the dispersion assessment, April 2022, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[3] See the member list attached to the report of the ALPS Subcommittee, dated February 10, 2020, p 54, available at:
< https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20200210_alps.pdf >.

- A report of the Tritiated Water Task Force[4] released in June 2016 addressed five disposal methods (geosphere injection, offshore release (discharge into the sea), vapor release, hydrogen release, and underground burial) and assessed them based on past examples of other countries.
- In February 2020, an ALPS Subcommittee report was compiled[5]. The report concluded that, of the five disposal methods, only vapor release and discharge into the sea were the most practical options taking into account safety concerns, the existing technology available and time constraints. The report also concluded that discharge into the sea could be "implemented more reliably, with respect to mitigating environmental and human health impacts, given that this discharge method is commonly used among nuclear plants around the world; discharge facilities have positive track records for safety; and controlled discharges into the sea can be monitored most accurately."[6]
- In response to the ALPS Subcommittee report, in April of the same year, the IAEA stated that "the recommendations made by the ALPS Subcommittee are based on a sufficiently comprehensive analysis and on a sound scientific and technical basis", and noted that the two options (vapor release and discharge into the sea) are "technically feasible"[7].
- In April 2021, the GOJ decided and announced the "Basic Policy", which included the selection of discharge into the sea as the method for disposing ALPS treated water, subject to necessary approval of the Nuclear Regulation Authority (NRA). Upon this announcement, the Director General of the IAEA (Mr. Grossi) stated that "Japan's chosen water disposal method is both technically feasible and in line with international practice", noting "controlled water discharges into the sea are routinely used by operating nuclear power plants in the world"[8]. In August 2021, the IAEA announced that "The IAEA Review Team appreciates the decision making of Government of Japan of a basic policy of disposition of the ALPS treated water following further purification as necessary and appropriate dilution. The decision on ALPS treated water disposition path was an important advisory point of previous reviews, and it will facilitate the implementation of the whole decommissioning plan."[9]

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[4] Tritiated Water Task Force (June 2016) "Tritiated Water Task Force Report", available at: <https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20160915_01a.pdf>.
[5] See the report of the ALPS Subcommittee, dated February 10, 2020, available at: < https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/20200210_alps.pdf >
[6] Ibid., p 32.
[7] IAEA (2 April 2020) "IAEA Follow-up Review of Progress Made on Management of ALPS Treated Water and the Report of the Subcommittee on Handling of ALPS treated water at TEPCO's Fukushima Daiichi Nuclear Power Station", p.6, available at: < https://www.iaea.org/sites/default/files/20/04/review-report-020420.pdf>.
[8] IAEA Press Release (13 April 2021) "IAEA Ready to Support Japan on Fukushima Water Disposal, Director General Grossi Says", available at: < https://www.iaea.org/newscenter/pressreleases/iaea-ready-to-support-japan-on-fukushima-water-disposal-director-general-grossi-says>.
[9] IAEA (June – August 2021) "IAEA INTERNATIONAL PEER REVIEW OF MID-AND-LONG-TERM ROADMAP TOWARDS THE DECOMMISSIONING OF TEPCO'S FUKUSHIMA DAIICHI NUCLEAR

- As outlined above, discharge into the sea was selected based on the GOJ's comprehensive examination of various options.
- Following the Basic Policy, and in accordance with the Reactor Regulation Act, TEPCO submitted an application for approval to amend the Implementation Plan originally approved by the NRA, an independent regulatory body, on 14 August 2013 to include designs for the dilution and discharge facility and to present a discharge and monitoring plan [10]. The application for approval to amend the Implementation Plan was accompanied by a radiological environmental impact assessment (REIA) report. The REIA report was revised in April 2022, taking into account discussions with the NRA and the comments expressed by general public and the IAEA. TEPCO plans to produce a further revised REIA report in the autumn of 2022. The REIA report will continue to be reviewed and revised as appropriate.
- The implementation plan, which considered the discussions with the NRA and the findings and observations of IAEA is under the procedure of approval by the NRA. The review continues and the discharge will not start until final approval of the pre-service inspection is granted by the NRA.
- To ensure safety and enhance transparency, a series of IAEA reviews are conducted and the review continues. If the IAEA makes any additional comments in the ongoing review, they will be considered and reflected before the discharge, as necessary, in the implementation plan and the REIA report.

POWER STATION (Fifth Review) Vienna, Austria Tokyo and Fukushima Prefecture, Japan", p.7, available at: < https://www.iaea.org/sites/default/files/21/08/review-report-270821.pdf>.

[10] TEPCO submitted the application to NRA on December 21, 2021. The application has subsequently been revised twice and submitted to NRA on April 28, 2022 and on May 13, 2022, respectively. For the latest information, see:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/20220513_01.html >.

[Question 3]

- *After treated by the ALPS, 70% of the nuclear contaminated water still exceeds the discharge limits values of Japan. Since the operation of the ALPS, the activity concentrations of iodine-129 and other nuclides has exceeded the discharge limits by many times. Please clarify the processing parameters, performance indicators and operation status, and explain the causes of the above problems. What will be done if there is an abnormality or the processing capacity decreases? How can the Japanese side ensure that the large-scale secondary treatment of the substandard nuclear contaminated water can achieve the expected results? Will the Japanese side make evaluations on the capacity of ALPS to purify the additional nuclear contaminated water, generated during the decommissioning of units 1 to 4 of Fukushima Daiichi nuclear power plant, to meet international safety standards before discharging into the sea?*

[Japan's Answer 3]

- First, we address the assertion that "70% of the nuclear contaminated water still exceeds the discharge limits values of Japan".
- As stated in the question, as of 30 June 2022, approximately 70% of the water stored in tanks contains radionuclides at concentrations exceeding the regulatory standards for discharge into the environment. This excessive concentrations occurred, as detailed in Section II-7 of Attachment II of TEPCO's revised REIA report of April 2022[11], due to facility trouble immediately after the start of the operation of ALPS. In addition, adsorbent materials integral to the ALPS treatment process are consumables that decrease in efficacy over time, and when replaced with high frequency, are highly effective at reducing the concentrations of radionuclides other than tritium below regulatory limits. However, prior to May 2019, in order to prioritize reducing the exposure dose to the public at the site boundary and to prioritize treating water stored in the flange type tank which had a high risk of leakage, TEPCO decided to temporarily reduce the frequency with which it replaced adsorbent materials in the ALPS adsorption towers so as to reduce interruptions to treatment of contaminated water. Since May 2019, concentrations of radionuclides other than tritium in the water treated through the ALPS process have been successfully and consistently reduced below regulatory standard values.[12]
- TEPCO has decided to repeat the purification process with respect to the treated water as many times as necessary until it is confirmed that the concentration of radionuclides

[11] See Section II-7 of Attachment II of TEPCO's Revised REIA Report, April 2022, available at: <https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[12] See Section II-3 of Attachment II of TEPCO's Revised REIA Report, April 2022, available at: https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf , and Table 5-1-1 on page 14 of the TEPCO's revised REIA report for a list of regulatory concentration limits of the 64 nuclides, April 2022, available at: <https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

other than tritium is below the regulatory standard (which would be necessary before any discharge into the sea).

- TEPCO will analyze the radionuclides contained in the ALPS treated water before dilution and make all data available to the public on its website.
- After that, ALPS treated water is to be diluted more than 100 times with seawater to reduce the tritium concentration to less than 1,500 Bq/L (less than 1/40 of the regulatory standard) and the concentration of the nuclides other than tritium to less than 1/100 of the regulatory standard before any discharge commences.
- Second, we address the operational control of discharges in the event of decreases in ALPS processing capacity or any abnormality.
- TEPCO will not proceed with the controlled discharge of the ALPS treated water which does not fulfill the regulatory standards that have been set based on the recommendations of the ICRP. And the GOJ will not approve the discharge of the ALPS treated water before those regulatory standards set based on the recommendations of ICRP have been met. In addition, TEPCO will implement the monitoring, sampling water at each stage of dilution and discharge process to identify any anomalies.
- Discharges into the sea will be stopped immediately in the event of such an anomaly[13]. For this purpose, TEPCO's implementation plan includes, among others, the following measures: emergency isolation valves will be installed both in front of the seawater pipe header and in the facility enclosed by the tide wall; the ALPS treated water flowmeter will be dual-redundant for the event of a single device failure; and a spare seawater transfer pump will be installed.
- As explained above, approximately 70% of the water stored in the tanks exceeds the regulatory standard for discharge because the treatment was prioritized, not because there was a problem with the processing capacity of the ALPS. In recent years, the water has been purified to below the regulatory standard for discharge into the environment through the first treatment by ALPS.
- In addition, TEPCO has conducted tests to assess the performance of ALPS when it is used to re-purify the water that has been treated once (secondary treatment performance test) in September and October 2020. According to the latest results, reported on 24 December 2020, including an evaluation by a third-party organization (Kaken Co., Ltd.), it was confirmed that the secondary treatment by the ALPS reduced

[13] See Section 2.50.1.1.3 of TEPCO's Partial Revision of the Application for approval to amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station as Specified Nuclear Facility, dated May 13, 2022, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0102.pdf >.

the sum of ratios of concentrations excluding tritium to less than 1, as an expected performance[14].

- TEPCO's plans[15] have been reviewed by the NRA, not only with respect to the ALPS purification process which was already approved, but also as regards the transfer/dilution/discharge process of treated water. Furthermore, TEPCO has considered feedback from international experts, including those from the People's Republic of China and the Russian Federation, through missions conducted under the ongoing safety review by the IAEA. Japan will continue to prepare for the discharge in an objective and transparent manner.

[14] TEPCO (24 June 2021) "Results of Secondary Treatment Performance Tests for ALPS Treated Water (Third-Party Assessment)", p.1, available at: <https://www.tepco.co.jp/en/decommission/progress/watertreatment/images/20210624.pdf >

[15] See the TEPCO's Partial Revision of the Application for approval to amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station as Specified Nuclear Facility, dated May 13, 2022, available at: < https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0102.pdf > (1/2), and the TEPCO's Revised REIA Report, April 2022 , available at: < https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf > (2/2)

[Question 4]

- *The radioactivity monitoring before, during and after disposal of nuclear contaminated water is the basis for judging the effectiveness of the technology and treatment. Please explain how to determine the scope and location of monitoring, and the types of nuclides to be monitored? Whether the early warning level of monitoring is set, and what are the response measures for abnormalities? How are monitoring records kept?*

[Japan's Answer 4]

- In August 2011, the GOJ set up the Monitoring Coordination Meeting under the Nuclear Emergency Response Headquarters and formulated a "Comprehensive Radiation Monitoring Plan" in order to ensure and systematically implement a comprehensive environmental radiation monitoring programme in relation to the accident at FDNPS. Based on this plan, relevant ministries, local governments, and TEPCO (which is a nuclear power plant operator,) have been participating in the conduct of monitoring in cooperation with each other.
- The scope, locations, and types of nuclides to be monitored are described in this Comprehensive Radiation Monitoring Plan. In the latest version of the plan released on 30 March 2022 (for English version, on 14 April 2022)[16], the sea area monitoring conducted by TEPCO and the relevant ministries and agencies of the GOJ has been enhanced and expanded by adding sampling locations, sampling frequency, and the types of nuclides monitored.
- TEPCO started this enhanced and expanded sea area monitoring in April 2022. TEPCO will collate the results and establish a normal fluctuation range with respect to concentration of radionuclides in the sea water. TEPCO will immediately stop the discharge of ALPS treated water into the sea if the result of the monitoring indicates any kinds of anomalies[17]. TEPCO will then conduct another round of monitoring at the site and tentatively expand the scope and frequency of monitoring to check the situation in the surrounding sea area, if necessary.
- In addition to sea area monitoring after discharges have commenced, TEPCO will implement monitoring at the dilution/discharge facility at each stage of processing prior to discharge – including not only when water is pumped from the storage tanks/treatment tanks to the tanks at the dilution facility, but also when it is diluted, and after it is discharged. TEPCO will take measures to suspend discharges into the sea immediately

[16] Monitoring Coordination Meeting of the Nuclear Emergency Response Headquarters (revised on 30 March 2022) "Comprehensive Radiation Monitoring Plan", available at:
< https://radioactivity.nsr.go.jp/en/list/274/list-1.html >

[17] See Ref-Att1-11-14（Appendix-3）of TEPCO's Partial Revision of the Application for approval to amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station as Specified Nuclear Facility, dated May 13, 2022, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0102.pdf >

in the event that an anomaly is detected[18]. The GOJ and TEPCO have conducted monitoring of the surrounding environment including the sea area since the accident in 2011, and the results and data have been published on their websites and other media for all interested parties to access. We will continue to disclose the data in transparent manner.[19]

[18] See the Section 9-2 of the Radiological Environmental Impact Assessment (REIA) report for more details on the monitoring/confirmation programme to be implemented at the site, April 2022 , available at: < https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >

[19] See NRA's Monitoring information of environmental radioactivity level, available at: < https://radioactivity.nsr.go.jp/en/ >

[Question 5]

- *The volume of the storage tanks for nuclear contaminated water is up to 1000 cubic meters. It needs long and continuous stirring to be homogeneous. The results of sampling and monitoring before discharge are the basis for determining whether discharge is allowed, but Japanese side has not yet released information about the representativeness of sampling. Please indicate whether the storage tanks are equipped with agitation devices? If not, how to sample in different layers and different areas? And how to consider monitoring programmes and records for storage tanks?*

[Japan's Answer 5]

- TEPCO will measure and evaluate the concentration of radionuclides in the ALPS treated water by connecting all 10 tanks in the process, then sampling the water after homogenizing it with circulation pumps and agitation equipment in the measurement and confirmation facility before discharge into the sea. The circulation/agitation time required for homogenization will be set appropriately through the circulation/agitation verification test. Please refer to Section 5-3 of the revised REIA report for a detailed description of the dilution/discharge facility and Section 9-2 for details on the monitoring/confirmation programme to be implemented at the site.
- TEPCO conducted tests using a temporary circulation/agitation device and confirmed that homogeneity could be achieved through circulation/agitation operation.
- Regarding the results of monitoring, the GOJ and TEPCO have conducted monitoring of the surrounding environment including the sea area since the accident in 2011, and the results and data have been published on their websites for all interested parties to access. Please refer to Appendix II-5 of the revised REIA report for the storage tank data to date[20]. We will continue to disclose the data in a transparent manner.[21]

[20] TEPCO's Revised REIA Report, April 2022 , available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >
[21] See NRA's Monitoring information of environmental radioactivity level, available at:
< https://radioactivity.nsr.go.jp/en/ >

[Question 6]

- *At present, Japan published several sets of monitoring results and detection limits for 64 nuclides, but has not released the key information such as specific detection methods and uncertainties. Please clarify the measurement methods and their conformity with relevant standards.*

[Japan's Answer 6]

- Measurement and evaluation methods, target detection limits and compliance methods for each of the 64 analyzed nuclides are different[22].
- For example, for the evaluation of the concentration of each 10 nuclides (Pu-238, Pu-239, Pu-240, Pu-241, Am-241, Am-242m, Am-243, Cm-242, Cm-243, and Cm-244), the result of gross alpha measurement is used. For the eight nuclides except Pu-241 and Am-242m, the results of gross alpha measurements are used conservatively as the concentration of each of the alpha nuclides. This measurement method has been adopted by many countries in the field of radiation measurement as well as is the method presented in the IAEA document[23]. (Note: Measurement of gross α-ray is a simple and rapid method of analyzing the concentration of gross α-nuclides, although it cannot be used to identify nuclides.)
- In addition, specific measurement/evaluation methods and uncertainties of 64 radionuclides contained in the ALPS treated water have been disclosed in the course of the review process. For details, please refer to Document 1-1 (English translation, slides 88-120) of the 12th NRA ALPS Treated Water Review Meeting[24].

[22] See Section 9-2-1 of TEPCO's Revised REIA Report, April 2022 , available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >
[23] IAEA Safety Report Series No.67, "Monitoring for Compliance with Exemption and Clearance Levels"
[24] TEPCO (10 March 2022) "Installation of New ALPS Treated Water Dilution/ Discharge Facilities and Related Facilities", available at:
< https://www.tepco.co.jp/en/hd/decommission/information/committee/pdf/2022/alps_22031001-e.pdf >

[Question 7]

- *The criterion on whether the contaminated water from nuclear accident meets the emission standards in Japan is that the sum of ratios of activity concentrations of 63 radionuclides except for tritium to the emission concentration thresholds should be less than 1. Japan sets the sum of ratios for 55 radionuclides among them to be fixed at 0.3. Measurement data used to determine the sum of ratios for these 55 radionuclides is too little, since there are just three sets of data currently which say 0.553, 0.193 and 0.165. It lacks conservatism to set the sum of ratios to be 0.3 on the basis. Please explain the sufficiency of the reasons for setting the ratio at 0.3.*

[Japan's Answer 7]

- We would like to correct what is described in the question because it contains misunderstandings. As a criterion for judging whether the radioactivity concentration is below the regulatory standard when discharging the ALPS treated water into the sea, the detection limit is conservatively used for nuclides below the detection limit in order to confirm that the sum of ratios of concentration of each radionuclide other than tritium is less than 1 at this time. The ratio of concentration of 55 radionuclides will not be fixed at 0.3. Regarding the radionuclides to be measured and evaluated at the time of discharge into the sea, TEPCO initially made a conservative assumption and targeted 64 radionuclides.
- However, the NRA and IAEA pointed out that this assumption was unnecessarily conservative because many short lived radionuclides to be removed by ALPS may have already decayed to a sufficiently low level[25], so, on the basis of the NRA/IAEA's observations, TEPCO is now re-selecting the radionuclides to be measured and evaluated after identifying the radionuclides that may exist when the ALPS treated water is discharged into the sea, based on the knowledge of decommissioning and burial facilities in Japan.
- The NRA has judged that even if any other radionuclides than 64 radionuclides are present, the concentration would be extremely low and thus the sum of the ratios of each radionuclide to the concentration limit will not exceed 1. Furthermore, the NRA will review and confirm the results of TEPCO's re-selection before the discharge into the sea begins.
- Based on the results of 62 radionuclide analyses, excluding tritium and carbon-14, conducted in the past for existing ALPS outlet and additional ALPS outlet since 2015, the sum of ratios of concentration excluding the seven major radionuclides is generally 0.3 (0.28 to 0.37). This value is used to classify whether the water stored in the tanks is

[25] IAEA (February 2022) "IAEA Review of Safety Related Aspects of Handling ALPS Treated Water at TEPCO's Fukushima Daiichi Nuclear Power Station: Report1 review mission to TEPCO and METI, April 2022", p.19, available at:
< https://www.iaea.org/sites/default/files/report_1_review_mission_to_tepco_and_meti.pdf >.

the ALPS treated water or water in the process of being treated (i.e. water that needs to be treated further), not as a criterion to judge whether or not it can be discharged.

- In addition, the radionuclide compositions of the K4 tank group, J1-C tank group, and J1-G tank group are not significantly different from the radionuclide compositions of the ALPS treated water in the other tank groups with a sum of ratios of concentration of less than 1.

[Question 8]

- *It is an international practice to monitor each nuclide with a set limit when discharging liquid effluents from nuclear power plants. Japan has set limits for 64 nuclides in the nuclear contaminated water, but only tritium and 9 nuclides including cesium-134, cesium-137, strontium-90, cobalt-60, antimony-125, rubidium-106, technetium-99, carbon-14 and iodine-129 are measured, which is inconsistent with the international practice. Please explain the scientific basis.*

[Japan's Answer 8]

- We first address a misunderstanding indicated in this question.
- Before discharging the ALPS treated water, TEPCO currently plans to measure and evaluate tritium, carbon-14 and all other radionuclides to be removed by the ALPS. It will not limit itself to the nine radionuclides (as indicated in the question) when selecting the target of measurement and evaluation (see further the response to Question I-7 above). As stated in the response to Question I-3 above, TEPCO will not proceed with the controlled discharge of the ALPS treated water before meeting the regulatory standards which have been set based on the recommendations of the ICRP. The GOJ will not approve the discharge facility/operation of the ALPS treated water which does not fulfill those regulatory standards.
- As described in the response to Question I-7 above, following the observations of the IAEA, TEPCO is in the process of re-selecting the radionuclides to be measured and evaluated at measurement/confirmation facility.
- Furthermore, as described in the "Comprehensive Radiation Monitoring Plan"[26], the latest version of which was released on March 30, 2022 by the Monitoring Coordination Meeting, the relevant Japanese ministries and agencies and TEPCO will conduct monitoring of H-3, Cs-134, Cs-137, Sr-90, Pu-238, Pu-239, pu-240, Ru-106, Sb-125, Co-60, and I-129, which are either the radionuclides that have often been detected in ALPS treated water since the commencement of ALPS operation or typical alpha-emitting nuclides with high tendency of deposition in the environment, in the sea area close to FDNPS, and all results will be made publicly available. In addition, the GOJ will also conduct annual monitoring for other related radionuclides (basically 62 nuclides removed by ALPS and C-14).

[26] Monitoring Coordination Meeting of the Nuclear Emergency Response Headquarters "Comprehensive Radiation Monitoring Plan" (revised on 30 March 2022), available at: <https://radioactivity.nsr.go.jp/en/list/274/list-1.html >.

[Question 9]

- *For ensuring that the monitoring procedures, methods and results are all authentic, the TEPCO should explain whether it has made the quality control programme suited to the monitoring programme of the contaminated water from nuclear accident, and whether it has retained samples for subsequent remeasurement and verification. Will the Japanese government conduct the supervisory monitoring? Will the Japanese side allow experts from the relevant countries to sample the nuclear contaminated water discharged into the sea on site?*

[Japan's Answer 9]

- TEPCO's monitoring results will be reviewed by IAEA experts, and cross-checked by third-party institutions, as a means to demonstrate that the analysis has been reliably performed and that the obtained analysis values are appropriate.
- For a domestic third-party analysis organization, selection will be made from companies that have no vested interest in TEPCO and have obtained ISO/IEC-17025 and other certifications for analysis of radionuclides.
- In addition, the Inter Laboratory Comparison (ILC) has been conducted since 2014. This is a comparison of the results of analysis of seawater, seabed sediment, and fish samples collected jointly with the IAEA, foreign laboratories belonging to the IAEA's Analytical Laboratories for the Measurement of Environmental Radioactivity (ALMERA), and Japanese analytical laboratories. The data has been published by the IAEA. In this report, the IAEA evaluated that "(t)he results obtained in ILC 2021 demonstrate a continued high level of accuracy and competence on the part of the Japanese laboratories involved in the analyses of radionuclides in marine samples for the Sea Area Monitoring programme."[27] The ILC will continue to operate after the discharge of the ALPS treated water as well.
- Samples to be analyzed by TEPCO and its outsourcing contractors are stored in consideration of reanalysis until the analytical values are determined.
- As described in the response to Question I-4 above, the GOJ has set up the Monitoring Coordination Meeting under the Nuclear Emergency Response Headquarters and formulated a "Comprehensive Radiation Monitoring Plan" in order to ensure and systematically implement detailed environmental radiation monitoring outside TEPCO's FDNPS in relation to the accident at FDNPS. Based on this plan, relevant ministries, local governments, and TEPCO have been conducting monitoring in cooperation with each other.

[27] IAEA (2021) "Interlaboratory comparison 2021 Determination of radionuclides in seawater, sediment and fish - Marine Monitoring: Confidence Building and Data Quality Assurance", available at: <https://www.iaea.org/sites/default/files/22/06/2022-06-21_japan_ilc_2021_report_v4.2.pdf>

- The scope, locations, and types of nuclides to be monitored are described in this Comprehensive Radiation Monitoring Plan. As described in the response to Question I-4 above, in the latest version of the plan released on 30 March 2022 (for English version, on 14 April 2022)[28], the sea area monitoring conducted by TEPCO and the relevant ministries and agencies of the GOJ has been enhanced and expanded, by adding sampling locations, sampling frequency, and the types of nuclides monitored.
- In addition to the third-party analysis to be conducted upon TEPCO's request, the Japan Atomic Energy Agency (JAEA) will also analyze the ALPS treated water prior to discharge at the request of the GOJ.
- Regarding the involvement of foreign experts, as described above, we plan to continue to involve third-country laboratories in monitoring. Additionally, the IAEA is currently considering the participation of third country organizations in a monitoring project conducted by the IAEA.

[28] Monitoring Coordination Meeting of the Nuclear Emergency Response Headquarters "Comprehensive Radiation Monitoring Plan" (revised on 30 March 2022), available at: <https://radioactivity.nsr.go.jp/en/list/274/list-1.html >

[Question 10]

- *Did Japan disclose all the relevant monitoring data to the stakeholders? Would Japan invite the stakeholders to make evaluations, whole-process supervision and independent monitoring?*

[Japan's Answer 10]

- The GOJ and TEPCO have conducted monitoring of the surrounding environment including the sea area since the accident in 2011, and the results and data have been published on their websites for all interested parties to access[29].
- In addition, as described in the response to Question I-9 above, since 2014, the IAEA, overseas analytical laboratories belonging to the IAEA's ALMERA, and Japanese analytical laboratories have been conducting an ILC of radioactivity analysis results for seawater, seabed soil and fish samples collected in cooperation with the IAEA. The data has been published by the IAEA. The ILC will continue to operate after the discharge of the ALPS treated water as well.
- With regard to the discharge of groundwater pumped from sub-drain and groundwater bypass system, analytical results and others are disclosed and information is provided to the diplomatic missions in Tokyo and the IAEA once a month in principle, and is also available on the IAEA's website[30].
- As described in the responses to Questions I-4 and I-9 above, the sea area monitoring conducted by TEPCO and the relevant ministries and agencies of the GOJ based on the "Comprehensive Radiation Monitoring Plan"[31] has been enhanced and expanded. The IAEA will corroborate the monitoring under the Comprehensive Radiation Monitoring Plan by its own analysis and evaluation of the environmental samples at IAEA laboratories as well as independent third-party laboratories and the results will be published.
- In addition to TEPCO's measurements, third-party organizations such as JAEA will measure the concentration of tritium and radioactive materials contained in ALPS treated water. The IAEA will also analyze samples of ALPS treated water at IAEA's laboratories and will include third party laboratories in this independent corroboration exercise.

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[29] See NRA's Monitoring information of environmental radioactivity level, available at: < https://radioactivity.nsr.go.jp/en/ >

[30] IAEA "Fukushima Daiichi Status Updates", available at: <https://www.iaea.org/newscenter/focus/fukushima/status-update>

[31] Monitoring Coordination Meeting of the Nuclear Emergency Response Headquarters "Comprehensive Radiation Monitoring Plan" (revised on 30 March 2022), available at: <https://radioactivity.nsr.go.jp/en/list/274/list-1.html >.

[Question 11]

- *Japan should explain the detailed discharge programme for the contaminated water from nuclear accident, including the overall design of the discharge system, the discharge sequence, the discharge location, the discharge amount and frequency, the measures for discharge safety, the monitoring programme in each stage, the discharge process control and the review.*

[Japan's Answer 11]

- The GOJ has consistently provided explanations to the international community regarding the handling of the ALPS treated water and its discharge into the sea through more than 100 briefing sessions for diplomatic missions in Tokyo, bilateral dialogues with neighboring countries and regions including those in their respective capitals, site tours, presentations at technical conferences, public reports on the decommissioning process including the domestic procedure following the Basic Policy, and public reports on environmental monitoring results. Japan has been steadfast in its dedication to transparency with respect to the handling of ALPS treated water, including the domestic procedures following the Basic Policy.
- Regarding the points raised in this question, details were provided in TEPCO's application to the NRA for approval to amend the implementation plan for FDNPS in December of last year as well as in the revised application for approval to amend the implementation plan submitted in April of this year. (*) These documents as well as the NRA's Draft Review Results Document, explaining the contents and the results of its review of TEPCO's application, have been published in both Japanese and English. The NRA's Draft Review Result Document was submitted for public comments.
- The details of TEPCO's above-mentioned applications were explained in briefing sessions to the diplomatic missions in Tokyo when those applications were made. The Chinese and Russian diplomatic missions were invited to participate in those briefings.
- The details of the applications can be found in English at the TEPCO's websites.[32]
- The NRA's above-mentioned Draft Review Results Document can be found in English at the NRA's website[33].

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[32] TEPCO Press Release, "Submission of the 'Application Documents for Approval to Amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station Specified Nuclear Facility' Regarding the Handling of ALPS Treated Water", dated 21 December 2021, available at: <https://www.tepco.co.jp/en/hd/newsroom/press/archives/2021/20211221_02.html>, and "Revision of the 'Application Documents for Approval to Amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station Specified Nuclear Facility' Regarding the Handling of ALPS Treated Water", dated 28 April 2022, available at: <https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/20220428_03.html>

[33] NRA "[Draft] Review Results Document on the Application for Approval to Amend the Implementation Plan pertaining to Specified Nuclear Facility (Installation of ALPS Treated Water Discharge Facility) of Tokyo Electric Power Company Holdings Fukushima Daiichi Nuclear Power Station", available at: <https://www.nsr.go.jp/data/000393217.pdf>

(*) The following items are included in Application for approval to amend the Implementation Plan for Fukushima Daiichi Nuclear Power Station as Specified Nuclear Facility: II Design and equipment of Specified Nuclear Facilities (2.50 ALPS Treated Water Discharge Facility and the Related Facility) and related attachments, III Operational Safety of Specified Nuclear Facility (1.9 Operation Management of the ALPS Treated Water Discharge Facility) and Annexes to the Implementation Plan for Fukushima Daiichi Nuclear Power Station as Specified Nuclear Facility (Annex 27 Supplementary Explanation for ALPS Treated Water Discharge Facility).

For example, in the application submitted in April this year, the overall design of the discharge system, discharge sequence, and discharge locations are described in II-2-50-1 to II-2-50-18, II-2-50-Attachment1-1 to II-2-50-Attachment1-6, etc., and the discharge amount and frequency are described in III-3-1-9-1, III-3-1-9-20 to III-3-1-9-22, Ref-Att1-4 to Ref-Att1-5, Ref-Att1-9 to Ref-Att1-10 and others, and the measures for discharge safety, monitoring programs at each stage, and discharge process control and review are described in III-3-1-9-20 to III -3-1-9-22 and others.

[Question 12]

- *Internationally, liquid effluent emissions from nuclear facilities are usually monitored online. Please specify whether Japan has set up an online monitoring device. Does the lower detectable limit of online monitoring device meet the requirements of emission control? Can online monitoring control measures ensure that the emission of contaminated water from nuclear accident meet the emission requirements in Japan?*

[Japan's Answer 12]

- First, as mentioned in the response to Question I-1above, the water to be discharged from TEPCO's FDNPS is not "nuclear contaminated water," but rather "ALPS treated water" that has been purified to below regulatory standards for radionuclides other than tritium, and then further diluted to a level far below the regulatory standards for safety for all radioactive materials, including tritium.
- TEPCO will have measures in place to ensure that water that does not meet the regulatory standards will not be accidentally discharged into the sea, as follows.
- As indicated in the response to Question I-8 above, TEPCO will measure and evaluate tritium, carbon-14 and other radionuclides contained in the ALPS treated water prior to discharge. Specifically, (1) the concentration of radionuclides in the ALPS treated water is measured and evaluated in the measurement and confirmation process, and (2) the transition from the measurement and confirmation process to the discharge process is made by determining the tritium concentration required for setting the ALPS treated water flow rate and confirming that the sum of ratios of each radionuclide other than tritium to the concentration limit stipulated in the notification is less than 1.
- During discharge, the ALPS treated water flowmeter and seawater flowmeter monitor whether the ALPS treated water is diluted into seawater within the set value, and if there is deviation, the emergency isolation valve is designed to activate.
- In addition, by installing γ-ray radiation monitors in the ALPS treated water transfer piping, the design is such that if γ-rays are detected, an emergency shutoff signal is sent and the emergency isolation valve is activated.
- For our reference, please explain what an "online monitoring device" is as described in this question. We would be grateful if you could inform us what kind of measures are being taken in the People's Republic of China and the Russian Federation.

[Question 13]

- *Before the emission of contaminated water from nuclear accident, detailed marine environment monitoring programme and marine ecological monitoring programme should be developed to provide long-term follow-up monitoring of seawater, sediments, marine organisms, coastal organisms, seabed areas, etc., in order to assess the impact of contaminated water from nuclear accident emission on the marine environment and marine ecology. Please specify whether Japan has developed a programme and made it public? Who is responsible for developing the programme? Who is responsible for supervising the implementation of the programme? What role does the Japanese Government play in the monitoring process? Has the programme consulted stakeholders and neighbouring countries? Whether they are invited to participate in the verification of the implementation of programme? Will Japanese side monitor carbon-14 and other nuclides in sediments at the bottom of the sea where the nuclear contaminated water is discharged as well as the discharged water itself?*

[Japan's Answer 13]

- Regarding environmental monitoring related to the accident at TEPCO's FDNPS, as mentioned earlier, the Comprehensive Radiation Monitoring Plan was formulated by the Monitoring Coordination Meeting (chaired by the Minister of the Environment) in cooperation with relevant ministries and agencies, the operator, and local governments. In accordance with this plan, the monitoring is being conducted by relevant parties (as indicated in the plan). This plan and monitoring results are made public.[34]
- In order to [effectively] monitor fluctuations in tritium concentrations in the sea area before and after starting the discharge of ALPS treated water into the sea, the monitoring of seawater has been enhanced and expanded since Spring 2022 (i.e. approximately one year prior to the proposed commencement of the discharge), by adding sampling locations, sampling frequency, and the types of nuclides monitored (See also the responses to Questions I-4 and I-9 above). Monitoring of sea water will be continued after starting the discharge. Monitoring of aquatic organisms is also being conducted.
- The handling of the ALPS treated water including the monitoring program is under the review of the IAEA Task Force, which consists of the IAEA officials and international experts whom the IAEA has nominated from. These international experts include experts from the Republic of China and the Russian Federation.
- Monitoring of Cs-134, Cs-137, Sr-90, etc. has been conducted with respect to sea sediment in accordance with the Comprehensive Radiation Monitoring Plan. At this point,

[34] Monitoring Coordination Meeting of the Nuclear Emergency Response Headquarters "Comprehensive Radiation Monitoring Plan" (revised on 30 March 2022), available at: <https://radioactivity.nsr.go.jp/en/list/274/list-1.html >.

carbon-14 in sediment is not covered, but if there is any abnormality in these monitoring results, we will consider the possibility of conducting an additional survey.

[Question 14]

- *Please specify whether Japan intends to disclose all data on emission of contaminated water from nuclear accident and marine monitoring to the international community, including monitoring data while discharging the contaminated water from nuclear accident and marine monitoring data before and after the discharge? Will key samples be retained and adopted for remeasuring by international agencies, stakeholders and neighboring countries?*

[Japan's Answer 14]

- All of the monitoring results and data conducted by the GOJ and TEPCO of the surrounding environment including the sea area since the accident in 2011 have been made available for all interested parties to access. Please refer to the response to Question I-10 regarding the disclosure of the monitoring data.
- With regard to sample retention, samples after analysis by TEPCO are kept by its outsourcing contractors in consideration of reanalysis until the analytical values are determined.

[Question 15]

- *Operation and decommissioning of ALPS will generate secondary waste, such as waste resin, waste adsorption filter, waste equipment, etc.. Please specify the generation and management of such waste. How to deal with such waste? Please specify the generation and storage of solid waste after the Fukushima Daiichi Nuclear Accident and whether such wastes has been characterized? How does Japan consider the final disposal of such waste, and does it have corresponding disposal acceptance criteria? How does Japan consider the disposal of contaminated soil and waste from decommissioning? How to deal with the storage tanks and related piping facilities after nuclear contaminated water being treated?*

[Japan's Answer 15]

- Please refer to "Monthly progress" on the website of the Ministry of Economy, Trade and Industry on "Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4" for the status of waste generation and storage management methods.[35]
- With regard to understanding the properties of waste, sampling and analysis are being conducted while strengthening analytical capacity through the establishment of analytical facilities at the FDNP site and the development of analytical techniques. The construction of the first building of JAEA's analysis and research facility on the FDNP site was completed in June 2022, and analysis work is scheduled to begin in the near future.
- In disposing of radioactive waste, it is necessary to determine the overall picture of the waste and its treatment and disposal methods, and to develop the necessary safety regulations.
- The overall picture of the waste will be gradually revealed as the decommissioning process progresses. Based on the information currently available, the GOJ, Nuclear Damage Compensation and Decommissioning Facilitation Corporation (NDF), TEPCO, and others are working together in parallel to determine the properties of the waste, appropriate treatment methods, and how the waste can be safely disposed of.
- Until the final disposal method is determined, TEPCO will be responsible for the safe storage and management of the waste generated.

[35] METI, "Mid-and-Long-Term Roadmap towards the Decommissioning of TEPCO's Fukushima Daiichi Nuclear Power Station Units 1-4", available at:
< https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/#progress_status >.

[Question 16]

- *According to Japanese media reports, in October 2021, the temperature of some areas of the frozen soil (water retaining) wall of Fukushima Daiichi Nuclear Power Station increased abnormally. Please specify the current status of the frozen soil wall and whether it has an emergency plan to deal with the outflow of contaminated groundwater from the plant area after the thaw of the frozen soil wall?*

[Japan's Answer 16]

- In October 2021, there was an increase in temperature in a part of the frozen soil wall, which was announced by TEPCO. It occurred in a part of the several-meter-thick frozen soil wall, and there was no change in the water level difference between the inside and outside of the frozen soil wall. Therefore, it did not affect the impervious function of the wall. In addition, the temperature has already dropped below freezing as a result of the measures taken.
- Yes: measures for preventing outflow of contaminated water in the reactor buildings to groundwater are routinely conducted. By managing the water level outside the building at a higher level than inside the building, leakage of contaminated water from inside the building into the surrounding environment has been prevented. In addition, to prevent groundwater leakage from the site to the port, multilayered measures are being taken, including the installation of a seawall and the pumping of groundwater.

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

[Question 1]

- *When assessing the environmental impact of radionuclides, will the additional nuclear contaminated water generated during the decommissioning of Units 1 to 4 of the Fukushima Daiichi Nuclear Power Station be taken into account? What is the cumulative volume of water planned to discharge for the future?*

[Japan's Answer 1]

- As to the first question: water generated during the decommissioning of Units 1 to 4 of have been taken into account in the revised REIA report of April 2022. In the report, the discharge of all of the ALPS treated water generated on a daily basis is taken into account for the total amount of discharge. As shown in Appendix IV of the revised REIA report[36], the plan is to complete the discharge by 2051 in the range of 22 trillion Bq /year, which includes the water generated during the decommissioning of Unites 1 to 4.
- As to the second question, the total volume of the ALPS treated water to be discharged will be approximately 1.3 million m^3 of water stored in the tanks as of June 2022 plus the volume of ALPS treated water that will be generated thereafter.
- The amount of the ALPS treated water that will be generated will vary depending on weather conditions and the progress of measures to control the amount of contaminated water generated. Assuming that the amount of contaminated water generated will continue to be 100 m^3/day, which is the target value by 2025, until the discharge is completed, 36,500 m^3 /year multiplied by the discharge period of approximately 30 years yields an estimate of approximately 1.1 million m^3.
- However, assuming the 2025 target of 100 m^3/day is achieved, TEPCO plans to continue its efforts to further reduce the amount of contaminated water that is generated. Assuming that a further decrease in the amount of contaminated water generated is achieved, the total amount of the ALPS treated water generated and to be discharged over the relevant discharge period is expected to be less than 1.1 million m^3.
- Regarding the cumulative amount of tritium to be discharged, if 22 trillion Bq /year is discharged over a period of about 28 years from spring of 2023 to 2051, the amount would be about 28 times the source term (annual discharge amount) shown in Tables 6-1-1 to 6-1-3 of the same REIA report. However, 22 trillion Bq /year is the highest case, and the actual cumulative amount to be discharged is expected to be less than about

[36] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

28 times the source term (annual discharge amount). The discharge can be completed by 2051 even if the discharge is conducted actually at a level below 22 trillion Bq.

[Question 2]

- *In addition to the radioactive factors, has the Japanese side analyzed all the factors and consequences arising from the choice of this nuclear contaminated water treatment methods, such as social, economic, ecological and other impacts.*

[Japan's Answer 2]

- The analysis conducted with respect to the disposal options available, including discharge into the sea, has been described in response to Questions I-1 and I-2 above.
- In summary, following the Great East Japan Earthquake in 2011, careful consideration was given with respect to measures for decommissioning and dealing with contaminated water[, and treated water] based on the fundamental principle that "Japan is to balance reconstruction with decommissioning". Specifically, Japanese domestic experts in the "Tritiated Water Task Force" and the " Subcommittee on Handling of ALPS Treated Water" conducted comprehensive discussions for more than six years, addressing not only the technical aspects of the disposal methods available, but also the impact on human health and the environment as well as social perspectives such as reputational damage and with respect to the economic impact on relevant industries and regions. The GOJ's Basic Policy, which chose the method of discharge into the sea, was established after such comprehensive discussions.

[Question 3]

- *Does the Japanese side plan to include an optimization process for radiation protection of the public in the radiological impact assessment report as required by the IAEA Safety Standards (General Safety Guide GSG No.9 "Regulatory Control of Radioactive Discharges to the Environment")? To prevent or reduce uncontrolled discharges of nuclear contaminated water and to prevent or reduce radiation exposure to the public and workers in the accident, what emergency response plans have been considered by the Japanese government to ensure that necessary protective measures are taken in a timely manner?*

[Japan's Answer 3]

- Referring to the requirements and recommendations for the optimization of protection of the public as indicated in GSR Part 3 and GSG-9, the NRA determined the value of 0.05 mSv/year equivalent to the dose constraint. The value of 0.05 mSv/year was carefully set based on the range of dose constraint value indicated in the IAEA Safety Standards, while allowing a safety margin for unforeseen eventualities that might occur as decommissioning of TEPCO's FDNPS progresses.
- Based on the dose constraint of 0.05 mSv/year, the discharge of 2,700 trillion Bq/year of tritium would be the upper limit, from which the limit of discharge would be determined after optimization of protection.
- Based on the premise above, TEPCO has decided to keep the annual tritium discharge below 22 trillion Bq/year, recognizing that, in the process of adopting the GOJ's Basic Policy, consideration was given to factors for optimization of protection and safety associated with ALPS treated water discharge, such as the planning of the entire decommissioning, the effect of decay, the risk of accidental discharge during storage, occupational exposure and societal impacts. TEPCO also recognizes that this consideration led the Basic Policy to state that "[t]he total annual amount of tritium to be discharged will be at a level below the operational target value for tritium discharge of the FDNPS before the accident (22 trillion Bq/year). The amount will be reviewed periodically" as a public policy choice.
- As described above, the approval process for discharge and TEPCO's REIA are in line with the optimization process for protection of the public as described in the IAEA Safety Standards. Relevant information is also described in the REIA report (p. 94-95)[37].
- Discharges into the sea will be stopped immediately in the event of an anomaly. For this purpose, as described in the response to Question I-3 above, measures are being taken such as; emergency isolation valves will be installed in front of the seawater pipe header

[37] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

and in the facility enclosed by the tide wall, the ALPS treated water flowmeter will be redundant in case of a single device failure, and a spare seawater transfer pump will be installed.

[Question 4]

- *Why does TEPCO set the simulation time at one year, not a decade or more decades? How does Japan evaluate the impact of contaminated water from nuclear accident on global marine food chain and ecosystem, as well as the long-term impact of radionuclides on the marine environment after depositing to the bottom of the sea?*

[Japan's Answer 4]

- For the avoidance of doubt, the plan is not to discharge contaminated water. The plan is to treat the water using the ALPS and then to further dilute the ALPS treated water, so that the water to be discharged will be at a level much lower than the regulatory safety standards for all radioactive materials, including tritium. The plan also limits the annual tritium discharge to 22 trillion Bq which is the same level as that of nuclear power plants operating in Japan.
- As for the impact of nuclear accident, the results of the past and present monitoring activities[38] show that water quality in the surrounding sea area has greatly improved since the accident in 2011, and it has been confirmed to fully meet the international quality standards for drinking water established by the WHO[39]. ALPS treated water will be diluted using sea water taken in from the surrounding sea area, and even with the radionuclides contained in the sea water considered, TEPCO's revised REIA report showed that there was no substantial difference in the result. Relevant information is also described in Attachment V of the REIA report[40].
- With regard to the long-term impact of the discharge of ALPS treated water into the sea, TEPCO's revised REIA takes it into account by simulating the situation in which the discharge has taken place over long time. Accumulation of radioactive materials in the environment normally proceeds slowly over a long period of time. In TEPCO's revised REIA report, however, assessment is made based on conservative assumption that radioactive materials have accumulated in fish, seabed sediment, ship hulls, fishing nets, and others until they have reached equilibrium with seawater from the start of discharge.[41]

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[38] See the response to Questions I-4 and I-10 for information about monitoring activities since the accident in 2022.

[39] 10,000 Bq/L for tritium, 100 Bq/L for carbon-14, 10 Bq/L for cesium-134, cesium-137 and strontium-90. For other radionuclides and more details, see "Guidelines for Drinking-water Quality", 4th ed., table 9.2, p.211, available at:
< https://apps.who.int/iris/bitstream/handle/10665/44584/9789241548151_eng.pdf >

[40] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[41] Equilibrium with seawater is the state of maximum adsorption to seabed sediment, etc., and maximum accumulation in the organisms, and no further accumulation occurs.

- In addition, adsorption of radioactive materials in seabed sediment and others decreases the concentration of radioactive materials in the seawater. In TEPCO's REIA, however, it is conservatively assumed that there would be no such decrease.
- Therefore, although the evaluation periods are one year each in 2014 and 2019, the evaluation simulates the conditions under which the discharge has taken place over a long period of time (i.e. it assumes an accumulation of radioactive materials that would in fact have taken place over many years.).
- With respect to the assessment of the impacts of the discharge of diluted ALPS treated water on marine biota and the marine ecosystem, TEPCO has conducted a robust assessment in line with international best practices. In accordance with the ICRP Guidelines, TEPCO has assessed dose rates in three standard species of marine biota as reference species: the standard flatfish (left-eyed and right-eyed flounders), the standard crabs (Ovalipes punctatus and Portunus trituberculatus) and the standard brown seaweeds (sargassum and Eisenia bicyclis). The dose is assessed by comparison with the derived consideration reference level (DCRL) shown in ICRP Publication 124 "Protection of the Environment under Different Exposure Situations"[42] for each type of the reference plants and animals. The REIA results revealed low dose rates that are lower than 1/10,000 of the minimum limit value of the DCRL. Please see Chapter 7 of TEPCO's Revised REIA Report for further details.

[42] ICRP Pub.124 (2014) "Protection of the Environment under Different Exposure Situations", available at: < https://www.icrp.org/publication.asp?id=ICRP%20Publication%20124 >

[Question 5]

- *Why does the Report limit the calculated range of the transport diffusion of nuclides in seawater to the coastal waters of Japan, Instead of to the North Pacific Ocean, or even all global waters? Does the Japanese government have any data related to the simulation of water flow with radioactive isotopes at a distance of 100km from Honshu Island and the east coast of Hokkaido?*

[Japan's Answer 5]

- In TEPCO's revised REIA report, the model range for simulating tritium diffusion is 490 km x 270 km. Even within the model range, the impact is evaluated to be very small, with the highest result evaluated at the model boundary being 0.00026 Bq/L.
- In other words, the maximum annual average tritium concentration at the boundary of the calculation domain in the simulation is lower than the natural background concentrations of tritium in seawater (about 0.1 to 1 Bq/L), and is expected to become even lower by further dispersion outside the boundary.
- Therefore, we consider that the scope of this model is amply sufficient and that there would be no additional value in making the calculations at a larger scale.

[Question 6]

- *Why does the Report set the tritium concentration at the discharge outlet at 30Bq/L, which is far below the diluted goal 1500Bq/L as claimed? Please explain if this will lead to underestimated radiological impact of tritium exposure.*

[Japan's Answer 6]

- The reason why the tritium concentration at the discharge outlet at 30Bq/L is because the dispersion simulation of the revised REIA report was conducted as follows.
- In the dispersion simulation, the discharged amount of radioactivity of tritium per hour was used and the dilution by seawater was not considered. Given the annual discharge limit of 22 trillion Bq, discharge amount per hour was equal to approximately 2.5 billion Bq. It was assumed that tritium in the assessed mesh was spread out with uniformity immediately.
- In addition, the mesh size of this dispersion simulation was approximately 185m x 147m near the discharge outlet, and vertical layers were divided into 30 layers. The seafloor surface was approximately 2 meters high and the volume of the mesh was approximately 54 million L. The direction of the ocean current in the surrounding sea area is mostly in the north-south direction, and the north-south direction often switches every 2 to 3 days and 0.1 to 0.2 m/s is the most common ocean current velocity. Even 0.1 m/s, as the hourly rate would be 360 m, the seawater in the mesh would be replaced at least twice. Based on these conditions, a simulation was conducted and the annual average was calculated to be approximately 30 Bq/L.

[Question 7]

- *Japan's evaluation is based on the assumption that the treated contaminated water can meet the standard. Why didn't it evaluate the impact of the contaminated water if it would not reach the standard? Such assumption lacks credibility. Will Japan invite the stakeholders and international agencies to evaluate collectively?*

[Japan's Answer 7]

- TEPCO will measure and evaluate radionuclides to confirm that the sum of the ratios of concentration of radionuclides other than tritium is less than 1 before the ALPS treated water is diluted with seawater and discharged. TEPCO will never conduct the controlled discharge of the ALPS treated water before meeting regulatory standards set based on the recommendations of ICRP. The GOJ will not approve the discharge facility/operation of the ALPS treated water which does not fulfill regulatory standards set based on the recommendations of ICRP.
- Regarding the monitoring of the ALPS treated water, in addition to TEPCO's measurements, third-party organizations such as JAEA are to measure the concentration of tritium and radioactive materials. The IAEA will also perform an independent analysis of samples of the ALPS treated water at the IAEA's laboratories and third-party laboratories.
- TEPCO has measures and procedures for any circumstances where the monitoring shows that the water being discharged does not meet regulatory standards (see also the responses to Questions I-3 and I-4 above.).

[Question 8]

- *The "dilution" method which Japan applies only reduces discharge concentrations without substantially reducing total amount, how could it prove that dilution can reduce the impact on the overall marine environment? If it does not reduce the radiological impact, what is the purpose of dilution?*

[Japan's Answer 8]

- The regulation in Japan requires TEPCO to reduce the concentration of radionuclides contained in the water to be discharged to an extent possible by the means including absorption, decay and dilution. For the ALPS treated water to be discharged, in accordance with the Basic Policy, TEPCO will remove the radionuclides other than tritium by ALPS to achieve the level below the concentration limit stipulated in the regulation. Then for tritium that cannot be removed, TEPCO will dilute the ALPS treated water to reduce the concentration of tritium far below the regulatory limit and control the annual amount of tritium to be discharged within 22 trillion Bq. TEPCO conducted the radiological impact assessment with this 22 trillion Bq/year as source term and the assessment result shows that the impact both on humans and the environment is minimal.
- 22 trillion Bq/year was the target value for control at TEPCO's FDNPS during normal operation prior to the accident. Incidentally, this target value is about one-sixth the amount of tritium discharged by the Qinshan-III Nuclear Power Plant in the People's Republic of China in 2019 (about 123 trillion Bq/ year).

  [Reference] Comparison of total annual discharge of liquid tritium between Japan and China[43]

  Japan: approx. 370 trillion Bq (average for 5 years before the 2011 FDNPS accident)

  People's Republic of China: approx. 832 trillion Bq (2018, Source: "Nuclear Energy Yearbook")

[43] For more information on amount of tritium emissions at major nuclear facilities around the world, see Ministry of Economy, Trade and Industry website, 'What is "ALPS treated water?"', p 9, available at: < https://www.meti.go.jp/english/earthquake/nuclear/decommissioning/pdf/alps_10pages_en.pdf >.

[Question 9]

- *At present, there are new studies on the combined exposure toxicity of radionuclides and other pollutants. It indicates that the public health effect caused by the combined exposure of radionuclides and other pollutants in seafood is an issue that needs to be paid attention to in health risk assessment. How does the Japanese side consider the health effects of combined exposure of tritium and other toxin substances? If yes, please provide relevant detailed data. At the same time, the report should not only provide dose estimation, but also assess the health effects.*

[Japan's Answer 9]

- ALPS is equipped with co-sedimentation, adsorption, and physical filters, all of which are used to remove the 62 radionuclides identified to levels below regulatory standard, regardless of their chemical form. TEPCO has monitored substances other than radioactive materials in the ALPS treated water and concluded that the chemical substances measured in the ALPS treated water were removed entirely or far below regulatory limits. The chemical quality data of the ALPS treated water, including hazardous substances, is shown in Section II-6 of Attachment II of the REIA report[44].

- Regarding the combined exposure toxicity of radionuclides and other pollutants, and noting the reference to recent studies, analyses we would be grateful if the Republic of China and the Russian Federation could provide the relevant information on the studies.

[44] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[Question 10]

- *In terms of radiation weight factor and relative biological efficiency of tritium and carbon, the assessment report should take full account of the latest research results and evaluate the risk of long-term health effects caused by Auger electrons of tritium and carbon-14. How does the Japanese side consider this?.*

[Japan's Answer 10]

- TEPCO's REIA was conducted in accordance with internationally recognized methods (IAEA Safety Standards Document, ICRP Recommendations). We believe that exposure to Auger electrons is appropriately protected under the scheme of the ICRP and IAEA radiation protection. We are not aware of any new researches evaluating the risk of long-term health effects caused by Auger electrons of tritium and carbon-14.
- We would like to know what kind of safety measures are being implemented in the Republic of China and the Russian Federation with respect to the exposure from Auger electrons.

[Question 11]

- *With regard to the concentration effect of radionuclides in marine organisms, the assessment report should take full account of the enrichment of radionuclides in certain foods and their long-term health effects caused by biological chain transfer following the discharge of the nuclear contaminated water. How does the Japanese side plan to assess that?*

[Japan's Answer 11]

- The concentration coefficients for marine plants and animals used in the REIA are based on the values described in documents issued by the IAEA, an internationally recognized organization, and are recognized as having a scientific evidence. These values take into account long-term health effects through the food chain.[45]
- Please also see the response to Question II-4 above, for details on the calculated effects of the discharges on marine biota.

[45] For the concentration coefficient for ingestion of seafood, see IAEA Technical report series No.422, "Sediment Distribution Coefficients and Concentration Factors for Biota in the Marine Environment", available at:
< https://www-pub.iaea.org/MTCD/Publications/PDF/TRS422_web.pdf >.
For the concentration coefficient for impact on marine biota, see the IAEA Technical report series No.479, "Handbook of Parameter Values for the Prediction of Radionuclide Transfer to Wildlife", available at: < https://www-pub.iaea.org/MTCD/Publications/PDF/Trs479_web.pdf >, and ICRP Publication 114, "Environmental Protection: Transfer Parameters for Reference Animals and Plants", available at: < https://journals.sagepub.com/doi/pdf/10.1177/ANIB_39_6P114>.

[Question 12]

- *Please explain the basis for the assessment of radiological impacts only in the coastal areas within 10 km. Why not assess the northwest fishing area of the North Pacific fishing ground and many fishing grounds on the west coast of North America, which are located on the radionuclides transport path, and why not consider the impact on public psychology and the resulting impact on fisheries?*

[Japan's Answer 12]

- In TEPCO's revised REIA report, radiological impact on the public is assessed by calculating exposure dose to "the representative person" who is assumed to be those engaged in the local fishing industry, and the location of the fishing port (the closest fishing port to the power plant is more than 5 km away) and other environmental circumstances around the site were taken into account while balancing reality and conservativeness. As a result, TEPCO used the average seawater concentration for a 10 km square centered on the FDNPS, since it was assumed that fishing is conducted only within a "10 km x 10 km" area.
- In the revised REIA report, it was confirmed that, in addition to the 10 km x 10 km, the concentration was about three times higher when the assessment was conducted for the narrower 5 km x 5 km area, and about two times lower when the assessment was conducted for the wider 20 km x 10 km area. All were far below the dose limit for the general public of 1 mSv/year, as well as 0.05 mSv/year, which corresponds to the dose constraint.
- In addition, as described in the response to Question II-5 above, in TEPCO's revised REIA report, the model range for simulating tritium diffusion is 490 km x 270 km. Even within the model range, the impact is evaluated to be very small, with the highest result evaluated at the model boundary being 0.00026 Bq/L.
- With respect to the impacts on public psychology and resulting impacts on fisheries, Japan considered these and other social and reputational factors in developing and adopting the Basic Policy, as described in the answer to Question II-2 above.

[Question 13]

- *What is the monitoring plan about radiation environment and marine ecology of surrounding sea area during the control and discharge process of nuclear contaminated water? How to identify and respond to the abnormal conditions through monitoring?*

[Japan's Answer 13]

- With respect to discharging the ALPS treated water into the sea, the GOJ and TEPCO enhanced and expanded the monitoring this year (2022), for example by adding sampling points around the discharge points.[46]

  For details, please refer to Chapter 9 "Monitoring to be performed in response to discharge of the ALPS treated water into the sea" of the revised REIA report[47].

- With reference to the monitoring results from this year, on commencement of any discharge of the ALPS treated water into the sea, TEPCO will monitor the fluctuations in the concentrations of radioactive materials to identify what level of concentration should be considered as abnormal values. If abnormal values are detected, TEPCO is required to stop the discharge until it is confirmed that the conditions are established for safe discharge.

[46] For the detail of the monitoring such as frequency of monitoring, location etc., see the latest Comprehensive Radiation Plan (2022), available at:
< https://radioactivity.nsr.go.jp/en/contents/16000/15554/24/274_20220330.pdf >.

[47] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[Question 14]

- *Different nuclides and different exposure pathways have different effects on human and marine ecology. Using the total ratio of each radionuclides seems to be qualified, however the actual dose will be higher than the ideal assessment dose. What is the basis for this dose calculation method? Why are conservative assumptions not made for some nuclides with large dose contributions such as Iodine-129?*

[Japan's Answer 14]

- In the revised REIA report, for each of the 64 radionuclides to be evaluated, TEPCO evaluated the internal exposure due to the ingestion of marine products, which have a particularly large contribution to the total dose, for the case where each radionuclide is discharged at the regulation value specified by Japanese laws and regulations. As a result, it was not iodine-129 that had the greatest impact, but isotopes of tin, iron, cadmium and others, which have higher concentration factors (iodine-129 was the 26th of 64 nuclides). The impacts of continuous discharge of source terms consisting solely of such isotopes as a fairly extreme assessment condition were also evaluated (see Reference C in the revised REIA report), and the assessment was sufficiently lower than the dose constraint even in the case of ingestion of a larger amount of marine products.
- The assessment has been pointed out by the IAEA Task Force, which also includes experts from the People's Republic of China and the Russian Federation, that it is overly conservative and that a more realistic assessment should be made.
- The exposure assessment in the report is based on conservative assumptions. As considered in section 8 of the main body of the revised REIA report[48], the assessment result would remain below the dose constraint even if the main source of uncertainty is considered in the assessment.

[48] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[Question 15]

- *Please explain the scientific basis of the marine radionuclides transport model and transfer parameters of radionuclides in marine environment.*

[Japan's Answer 15]

- The details of the modeling parameters of dispersion and transfer in the environment adopted by TEPCO in this REIA are described in the revised REIA report 6-1-2. (2) Modeling of post-discharge dispersion and transfer and (3) Establishment of exposure pathways.[49]
- The validity of the dispersion model is supplemented in Appendix VII, the results of the evaluation using different evaluation methods are supplemented in Appendix VI, and the conservatism of the external exposure conversion coefficients is supplemented in Appendix XI of the same report.

[49] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[Question 16]

- *The report lacks basic information on the environment directly related to the radiological impact assessment, such as the potential maximum exposure residential areas and their population distribution, food sources, offshore operations, etc. Why didn't the Japanese side provide this information?*

[Japan's Answer 16]

- In the areas surrounding the FDNPS, measures that unable the general public to reside in certain areas have been taken. These areas include the difficult-to-return zones that have been resulted from the accident, and the interim storage facilities that surround the land side of the power plant. The fishing industry in Fukushima Prefecture is still in the process of recovery, having only moved into full-scale operations in April 2021.
- It is impossible to obtain habit data characteristics in the region near the FDNPS in a comprehensive manner to be used for the identification of the representative person in the REIA since habitation around FDNPS is restricted after the FDNPS accident in 2011. Therefore, TEPCO conducted an evaluation based on the results of a survey on food consumption by the Japanese public as well as individual characteristics based on the evaluation for existing nuclear reactor facilities as alternatives to these data.
- Specific representative person characteristics are described in detail on pp.70-73 of the REIA report (English version)[50], including the time of fishing and coastal activities, setting of assessment points, and setting of marine product intake.
- The REIA report is a living document. As reconstruction progresses in the area and actual data accumulates, TEPCO will obtain data on lifestyle habits and characteristics for the representative persons in the area surrounding the FDNPS.

[50] TEPCO, "Radiological Impact Assessment Report Regarding the Discharge of ALPS Treated Water into the Sea (Design stage / Revised version)", April 2020, available at:
< https://www.tepco.co.jp/en/hd/newsroom/press/archives/2022/pdf/220513e0101.pdf >.

[Question 17]

- *The information related to ecological surveys in the report is incomplete, why does it lack justification for the selection of representative plant and animal samples? Does the Japanese government have information on water samples collected and processed at a distance of 100km from the coast of Japan? And are there any analysis data on radioisotope potassium in the aquatic biota samples?*

[Japan's Answer 17]

- The REIA was conducted based on internationally recognized standards. For the selection of representative plant and animal species to be evaluated, the REIA was conducted for all three species in the marine ecosystem for which reference values have been set by the ICRP as reference plants and animals: flat fish, crabs, and brown seaweeds.
- TEPCO will consider conducting additional assessments in the future if the target organisms are reflected in internationally recognized standards as progress is made in this respect.
- As described in the "Comprehensive Radiation Monitoring Plan"[51], the NRA monitors Cs-134 and Cs-137 in seawater in the open ocean generally 90 km or more from the coastline, and there are some measuring points 300 km or more away. In the Comprehensive Radiation Monitoring Plan, radioactive potassium is not included in the radionuclides to be monitored for aquatic organisms. The target radionuclides for monitoring of aquatic organisms are Cs-134 and C-137, and if necessary, Sr-90. In addition, H-3 and C-14 for fish and I-129 for seaweeds were newly designated as nuclides to be monitored due to the discharge of treated water.

[51] The latest "Comprehensive Radiation Monitoring Plan" is available at:
< https://radioactivity.nsr.go.jp/en/list/274/list-1.html >.

[Question 18]

- *The Report should identify the key population groups and evaluate the maximum effective dose those were subjected to. Please explain why the Report chose only two specific population groups' annual seafood consumption data.*

[Japan's Answer 18]

- Please refer to the response to II-16 for a description of the approach to setting the representative person.
- The amount of marine product intake is conservatively set not only the average intake, but also the high intake, which is the average intake plus twice the standard deviation based on the data from the latest large-scale survey from the Japanese population as a whole.
- This data of intake amount is statistical data for the whole of Japan, but the difference from the data for the Tohoku region, where FDNPS is located, is only about 10% difference, which is much smaller difference than that of the evaluated dose to the public against the dose constraint. Meanwhile, in the assessment in the revised REIA report, all ingested fish are assumed to have been caught in the area around FDNPS, so there is not considered to be underestimation.

[Question 19]

- *Please explain the representativeness of the use of meteorological ocean data in 2014 and 2019 to calculate the ocean dispersion. Did Japan consider the impact of the climate conditions on a global scale (like El Nino and La Nina phenomenon) and the changing ocean currents?*

[Japan's Answer 19]

- As shown in Appendix VII of the revised REIA report, fluctuations due to the fluctuation of meteorological and oceanographic data by each year from 2014 to 2020 were confirmed. As a result, it is confirmed that the fluctuations in the annual mean concentration and dispersion extent of all layers in the 10 km x 10 km range are small and that it is appropriate to use the calculation results for 2019 for representative.
- In the dispersion simulations, the effects of ocean currents (Kuroshio and Oyashio) in the offshore area were taken into account in the evaluation. According to the definition of the Japan Meteorological Agency, El Niño events (summer 2014 to spring 2016 and autumn 2018 to spring 2019) or La Niña events (autumn 2017 to spring 2018 and summer 2020 to spring 2021) have occurred during these periods, and these conditions were taken into consideration.

[Question 20]

- *Why didn't the Japanese side invite independent third parties to carry out the radiological impact assessment? The sponsor and the leader of assessment members of the radiological impact assessment report are both from TEPCO, how can their objectivity and impartiality be ensured? Why is the company in charge of specific tasks for discharge, instead of the Japanese nuclear safety regulatory authorities, to confirm that the discharge is safe?*

[Japan's Answer 20]

- In accordance with the requirements of the Reactor Regulation Act, no discharges can commence until the NRA, an independent regulatory body, has reviewed TEPCO's Amended Implementation Plan, which was submitted with a reference material, the REIA report. TEPCO's REIA report has undergone an iterative review and revision process, incorporating discussion with the NRA, as well as comments solicited by TEPCO from the general public and members of the global scientific community.
- The NRA and TEPCO had discussions during 13 review sessions from 24 December 2021 through 15 April 2022, during which the NRA requested explanation and clarification from TEPCO and requested that further assessments and data be included in a revised submission. TEPCO submitted a revised version of this report in April and May of this year based on comments received at the review meetings.
- Furthermore, the REIA report was revised not only based on the comments from the NRA, but also from the international experts of the IAEA Task Force for the Safety Review of the ALPS Treated Water. That Task Force includes experts from the People's Republic of China and the Russian Federation. Objectivity, scientific accuracy, transparency and fairness have been assured by these procedures.