

Executive Summary

In April 2021, the Government of Japan released its *Basic Policy on Handling of ALPS Treated Water at the Tokyo Electric Power Company Holdings' (TEPCO) Fukushima Daiichi Nuclear Power Station* (Basic Policy). This policy resulted from a programme of review by the relevant Japanese government ministries, and TEPCO, about how to manage the accumulating ALPS treated water stored on site at the Fukushima Daiichi Nuclear Power Station (FDNPS). The Basic Policy describes, among other topics, the method selected by the Government of Japan for the handling of the Advanced Liquid Processing System (ALPS) treated water which was to discharge the treated water into the sea.

Following the announcement of this policy, the Government of Japan requested that the IAEA conduct a detail review of the safety related aspects of handling ALPS treated water stored at FDNPS, applying the relevant international safety standards. The IAEA Director General accepted this request and noted the IAEA's commitment to being involved before, during, and after the ALPS treated water discharges. **The IAEA is conducting this review in compliance with its relevant IAEA statutory functions, in particular, that established in Article 3.A.6 of the IAEA Statute which declares that the Agency is authorized:**

“To establish or adopt, in consultation and, where appropriate, in collaboration with the competent organs of the United Nations and with the specialized agencies concerned, standards of safety for protection of health and minimization of danger to life and property (including such standards for labour conditions), ... and to provide for the application of these standards, ... at the request of a State, to any of that State's activities in the field of atomic energy.”

In July 2021, the IAEA and the Government of Japan signed the Terms of Reference for IAEA Assistance to Japan on Review of Safety Aspects of ALPS Treated Water at TEPCO's FDNPS. The IAEA activities in this regard consist of a technical review to assess whether the actions of TEPCO and the Government of Japan to discharge the ALPS treated water over the coming decades are consistent with international safety standards. The IAEA is also undertaking all necessary activities for the corroboration of the source and environmental monitoring programmes of TEPCO and the Government of Japan before, during and after the discharges. The IAEA's review is organized into the following three major components to ensure all key safety elements are adequately addressed: 1) Assessment of Protection and Safety, 2) Regulatory Activities and Processes, and 3) Independent Sampling, Data Corroboration, and Analysis.

To implement the IAEA's review in a transparent and inclusive manner, the IAEA Director General established a Task Force. The Task Force operates under the authority of the IAEA and is chaired by a senior IAEA official. The Task Force includes experts from the IAEA Secretariat alongside internationally recognized independent experts with extensive experience from a wide range of technical specialties from Argentina, Australia, Canada, China, France, the Marshall Islands, the Republic of Korea, the Russian Federation, the United Kingdom, the United States and Viet Nam. These independent experts provide advice and serve on the Task Force in their individual professional capacity to help ensure the IAEA's review is comprehensive, benefits from the best international expertise and includes a diverse range of technical viewpoints.

Since September 2021 when the IAEA Task Force held its first meeting, there have been five review missions, six technical reports, and numerous Task Force meetings. A summary of these activities and key milestones are included in Annex 1. Throughout this process the Task Force received information from the Government of Japan and TEPCO which helped the experts to better understand the technical and regulatory aspects of the planned discharges of ALPS treated water. The technical reports of the missions include summaries of the IAEA's review and show the progress made by TEPCO and the Government of Japan. Over the past two years, the Task Force and the Government of Japan have identified and built on the observations from these previous missions and the IAEA is now in a position to draw comprehensive conclusions about the safety of the discharge. Additionally, this review is occurring concurrently with Japan's Nuclear Regulation Authority's (NRA) domestic regulatory review

and approval. Therefore, the insights from the IAEA's review were considered in the domestic process in a timely and beneficial manner.

This comprehensive report includes explanations and insights over a broad range of topics that are important to understanding the overall safety-related aspects of this process; this represents the "before" stage of the IAEA's review as noted by the IAEA Director General. The purpose of this comprehensive report is to present the IAEA's final conclusions and findings of the technical review to assess whether the planned operation to discharge the ALPS treated water into the Pacific Ocean over the coming decades is consistent with relevant international safety standards. The reviews of individual topics included in this comprehensive report are based on hundreds of pages of technical and regulatory documentation, condensed and summarized to help make the conclusions from the IAEA's review more accessible and understandable for the general public. A summary of relevant international safety standards is included in Annex 2.

In order to fully assess whether the ALPS treated water discharge is conducted in a manner that is consistent with relevant international safety standards, the Task Force considered the Fundamental Principles for Safety, the Safety Requirements, and the supporting Safety Guides, published by the IAEA. These standards are standards of safety for the protection of health and minimization of danger to life and property. In compliance with the IAEA's statutory functions, these international safety standards are developed and co-sponsored in consultation with and, where appropriate, in collaboration with the competent organs of the United Nations and with specialized agencies. They serve as a global reference for protecting people and the environment and contribute to a harmonized high level of safety worldwide.

This report includes an assessment of the application of the fundamental safety principles, the relevant safety requirements, and supporting safety guides. It is important to note that in the application of the international safety standards, their principles and technical considerations, must be adapted to national circumstances.

Based on its comprehensive assessment, the IAEA has concluded that the approach to the discharge of ALPS treated water into the sea, and the associated activities by TEPCO, NRA, and the Government of Japan, are consistent with relevant international safety standards.

The IAEA recognizes that the discharge of the ALPS treated water has raised societal, political and environmental concerns, associated with the radiological aspects. However, the IAEA has concluded, based on its comprehensive assessment, that the discharge of the ALPS treated water, as currently planned by TEPCO, will have a negligible radiological impact on people and the environment.

Notwithstanding the above conclusions, the IAEA notes that once any discharges begin, many of the technical topics reviewed and assessed by the Task Force will need to be revisited by the IAEA at various times to assess the consistency of activities during the operation of the ALPS treated water discharges with relevant international safety standards

On May 2023, the IAEA published a report detailing the results of the first interlaboratory comparison conducted for the determination of radionuclides in samples of ALPS treated water. These findings provide confidence in TEPCO's capability for undertaking accurate and precise measurements related to the discharge of ALPS treated water. Furthermore, based on the observations of the IAEA, TEPCO has demonstrated that it has a sustainable and robust analytical system in place to support the ongoing technical needs at FDNPS during the discharge of ALPS treated water.

The IAEA is committed to engaging with Japan on the discharge of ALPS treated water not only before, but also during, and after the treated water discharges occur. The findings above relate to activities the Task Force performed before the water discharges start. However, the work of the IAEA and the Task Force will continue for many years. The IAEA will maintain an onsite presence at FDNPS throughout its review and will publish available data for use by the global community, including the provision of real-time and near real-time monitoring data from FDNPS. Additional review and monitoring activities are envisaged that will continue and which will provide additional transparency and reassurance to the

international community by continuously providing for the application of the relevant international safety standards.