ocean?

PREMIUM

Japan plans to start flushing 1.2 million tonnes of water from the embattled nuclear power plant into the Pacific Ocean from this year.

January 26, 2023 11:01 pm | Updated January 29, 2023 04:46 pm IST

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An aerial photo of the Fukushima Daiichi nuclear power plant in Okuma, Fukushima prefecture, March 17, 2022. | Photo Credit: Shohei Miyano/Kyodo News via AP

Japan is expected to start flushing 1.25 million tonnes of wastewater from the embattled Fukushima nuclear power plant into the Pacific Ocean this year, as part of a $76-billion project to decommission the facility. The project received the Japanese cabinet's approval in 2021 and could take three decades to complete. The idea, which experts and officials in Japan had floated in 2016, has been controversial for its suspected impact on the water, marine life, fishers'

levels, and exposed themselves to the ambient air, water, soil, and local population. Winds also carried radioactive material thrown up into the air into the Pacific. Since then, the power plant and its surrounding land have been uninhabitable.

The water that the Japanese government wants to flush from the plant was used to cool the reactors, plus rainwater and groundwater. It contains radioactive isotopes from the damaged reactors and is thus itself radioactive. Japan has said that it will release this water into the Pacific Ocean over the next 30 years.

Can't the water be treated?

The Tokyo Electric Power Company (TEPCO), which operates the Fukushima facility, has said it has treated the water to remove most radioactive isotopes; former Prime Minister Yoshihide Suga added in 2021 that the water will be "far above safety standards". His government required the water to have 1/40th as much tritium as the permitted limit.

Officials have defended the plan saying TEPCO is running out of room for the water-tanks and that nuclear plants around the world regularly release water containing trace amounts of radionuclides into large waterbodies.

However: "There is no known threshold below which radiation can be considered safe," M.V. Ramana, the Simons Chair in Disarmament, Global and Human Security at the University of British Columbia, Vancouver, told The Hindu. "[A]ny discharge of radioactive materials will increase the risk of cancer and other known health impacts to those who are exposed."

What if the water is released in a trickle? "Smaller discharges will obviously help with the extent of the risk – if you measure, say, expected numbers of cancers that might result – but it wouldn't necessarily affect the impact on the reputations of fisherfolk in the region," Dr. Ramana said.

Experts expect the affected water to poison the fish; "anyone who knows this is happening will, or should, avoid eating fish caught in the vicinity of the discharge point". South Korea banned seafood imported from around Fukushima, to Japan's displeasure, from 2013.

A file photo of the Fukushima Daiichi nuclear power plant in Okuma town. | Photo Credit: AP/Hiro Komae

TEPCO's treatment procedure couldn't entirely remove. These include isotopes of ruthenium and plutonium, which could persist for longer in the bodies of marine creatures and on the seafloor.

What are Japan's other options?

Some have asked why the Japanese government can't store the water for longer and then discharge it. This is because tritium's half-life – the time it takes for its quantity to be halved through radioactive decay – is 12-13 years. The quantity of any other radioactive isotopes present in the water will also decrease in this time (each isotope has its own half-life). So at the time of discharge, the water could be less radioactive.

The Japanese government has also declared land around the Fukushima facility to be uninhabitable. The thousand or so tanks to hold the water, each with a capacity of 1,000 m3, can be situated here.

But in 2020, authorities determined that flushing the water would be the way forward, over storage and vapourisation. Many experts agreed. After visiting Fukushima in February 2020, International Atomic Energy Agency (IAEA) officials also said the discharge would be "technically feasible and would allow the timeline objective to be achieved".

Will the Pacific Ocean be affected?

There are concerns about the waterbody as well as the region.

China, South Korea and Taiwan have expressed concerns over Japan's plan. A representative of the Pacific Islands Forum, the bloc of Oceania countries including Australia, has called it "simply inconceivable" based on their experience with "nuclear contamination".

Researchers have also called for more studies to understand the precise composition of each tank before it is flushed and for more details about TEPCO's water-treatment process.

A view of the Kudankulam Nuclear Power Plant, Tamil Nadu. | Photo Credit: Shaikmohideen A./The Hindu, File

How will the rest of the world be affected?

All nuclear accidents have global repercussions.

The Fukushima Daiichi accident triggered an avalanche of public opposition to nuclear power worldwide, especially in Europe, diminishing its contribution to the clean-energy power generation mix.

In Japan itself, the accident reduced nuclear power's contribution to electricity generation from 30% before 2011 to 5% in 2022. But the incumbent Fumio Kishida government has articulated plans to upgrade and restart older reactors and build new ones in response to the increasing cost of fossil fuels.

However, both India and China doubled down on their domestic commitments. Then Prime Minister Manmohan Singh called nuclear energy an "essential option" for India's climate action and energy security. His successor Prime Minister Narendra Modi has clarified that India plans to expand its nuclear power programme with Russia's help.

Then again, the accident also revived concerns about some existing nuclear power plants – especially the Department of Atomic Energy's Kudankulam Nuclear Power Plant (KKNPP) facility in Tamil Nadu. In October 2012, police arrested nearly 2,000 protestors after they attempted to march to the Secretariat in Chennai against KKNPP, in response to the Fukushima accident and what they said were parallels between the two sites.

Ultimately, Japan is also concerned about its reputation. An official committee including scientists, consumers' representatives and ministry officials wrote in a 2020 report: "it is important to dispose of the ... treated water as part of the decommissioning work ... taking into account the reputational impact when the disposal method for the ... treated water is examined."