

Planned Release of Radioactively Contaminated Cooling Water from the Fukushima Nuclear Power Plant Disaster

Executive Summary from the Expert Panel to the Pacific Islands Forum June 2, 2022

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The Japanese Government is considering allowing the Tokyo Electric Power Company (TEPCO), to begin releasing over 1 million tons of radioactively contaminated cooling water from the Fukushima nuclear power plant disaster, starting in early 2023, over a period of decades. Construction of the associated facilities is planned to begin in July 2022. It is the unanimous opinion of the PIF Expert Panel that these decisions are premature given the scientific data and based upon recent discussions with Japanese government officials and experts as detailed below.

Recognizing the importance and value of open and candid scientific communication among the Japanese Government, TEPCO, IAEA and PIF Expert Panel, a 2-hour call was held on 2 June 2022, Fiji and Japan time with participation of representatives from all groups and the PIF Secretariat to discuss these issues and a collaborative way forward. The members of the PIF Expert Panel gave presentations on a variety of issues and concerns; following discussions on these elements of concern and further clarification of the information provided to date. There was no basic disagreement on the scientific issues raised by the PIF Expert Panel that was expressed by either the IAEA representative, Dr. Caruso, or members of the Japanese delegation.

These issues include, but are not limited to:

- The measurement data focused on just 10 of 62 radionuclides; 38 radionuclides were never sampled. A critical problem with this vast gap is that data from all 62 radionuclides are needed to apply the “sum of ratios” method chosen by TEPCO to demonstrate safety
- Most tanks have not been sampled, leading to obvious concerns about the magnitude of the radioactivity and radionuclide distributions in the tanks, the adequacy of the data, the efficiency required of ALPS and the level of dilution required.
- Statistical representativeness of the samples in relation to the radionuclide contents cannot be determined; for example, vertical concentration profiles are not provided, and the tanks are not agitated.
- Data provided indicate that there are sludges in the tanks. Presence of sludges raises many questions about data completeness, approach to dilution, and decommissioning of the tanks.

- Ratios of strontium-90 to cesium-137, and among other radionuclides in different tanks, varied by several orders of magnitude, with no explanation provided. The large ratio differences represent uneven functioning of the ALPS system, and/or widely varying source liquids.
- Limits of detection varied by orders of magnitude in some cases, a matter of obvious concern regarding measurement protocols.
- There is no urgency to release, if alternative space within the boundaries of the Fukushima Daiichi NPPs and surrounding areas is considered

Further, we also have concerns about the assumptions made for modeling radionuclide distribution and environmental effects of the planned releases and identifying exposure pathways and bioaccumulation in marine organisms of ecological, economic, and cultural importance. Despite dilution, bioaccumulation would lead to re-concentration in biota, leading to questions about whether, when, and where safety thresholds might be exceeded. There is insufficient information on the majority of radionuclides present and their combined and cumulative effects on environmental and human health. Moreover, we are not satisfied that post-discharge monitoring protocols will be up to the task of establishing that a claim of safety prior to discharge has in fact been achieved in practice.

During the 2 June 2022 meeting it was stated that water that did not meet specifications would not be discharged, even if it had to go through ALPS treatment 100's of times. We agree that discharge of water that does not meet specifications should not be allowed. Our concern is that that approach leaves far too much to the last moment, when discharges will be a *fait accompli*. It is far too risky to permit discharges without resolving the fundamental data and analytical issues that we have raised on two counts. First, it is not possible to make a scientifically sound declaration of safety until this is proven; we believe that as the international authority responsible for overseeing the process, the IAEA should not give the green light for proceeding with construction without the issues being resolved. Second, there is no practical way forward if indeed ALPS treatment does not work efficiently or consistently, or if any of the other issues, like sludges and bioconcentrations present insuperable problems. In addition, the opportunity to look at total costs and weigh an ocean discharge option against other alternatives will have been lost. This is the moment for scientific and ecological rigor; that requires a deferral of the decision to construct and discharge at least until all scientific parties can agree that the data and analytical procedures are adequate to make a valid determination of safety one way or another.

It has been stated by the Japanese government and IAEA that there will be no release if not safe. In sum, our review indicates that TEPCO is far from demonstrating safety and it will take far more time to arrive at a determination of safety than the proposed 2023 timeline for discharges. The decision to release is a transboundary and transgenerational issue of great concern to PIF and other nations. The Japanese government has the chance to lead by engaging in a more comprehensive assessment prior to any decision on release or other options.