

# Deficiencies in the TEPCO plan to discharge contaminated water into the Pacific Ocean

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# OUTLINE

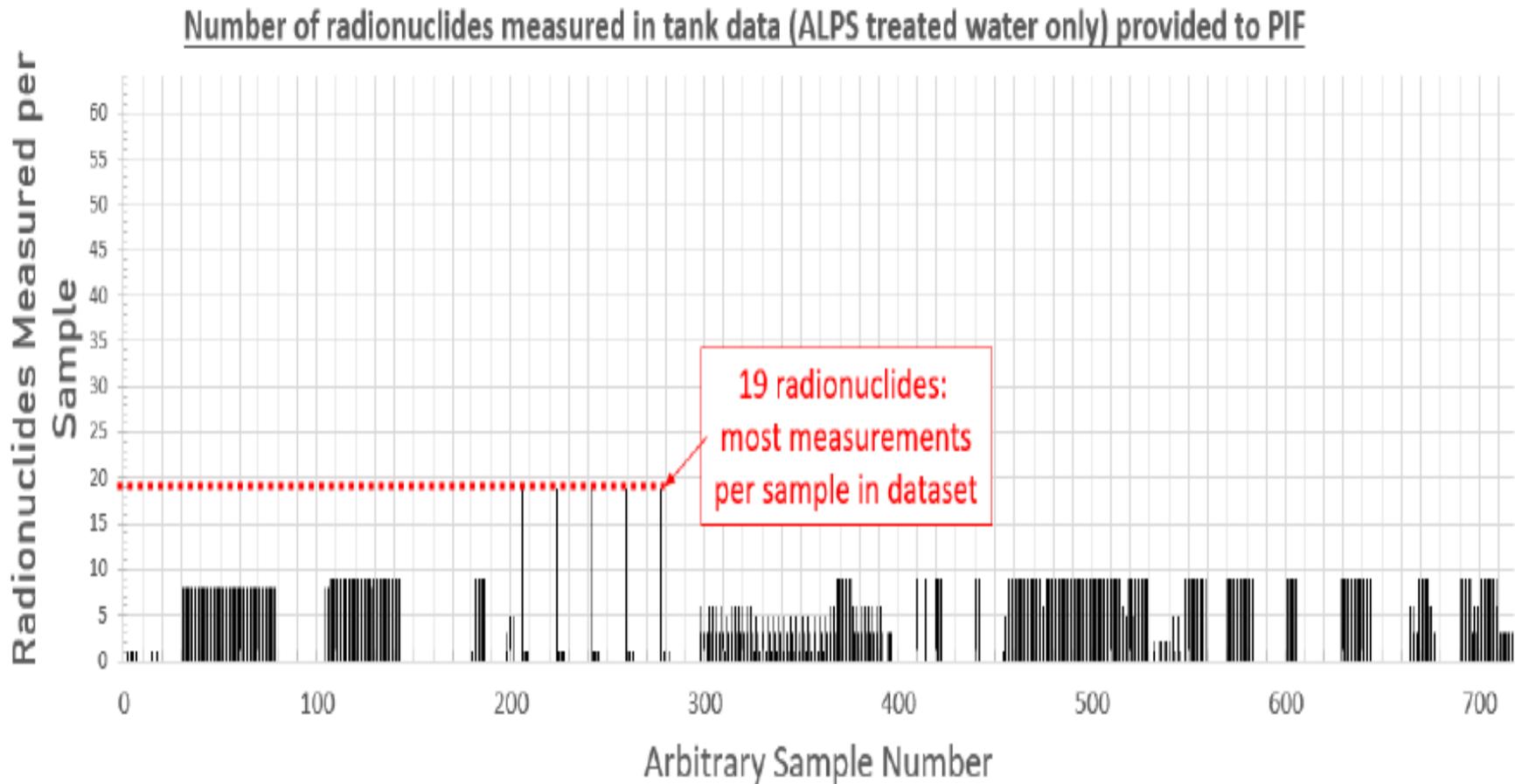
There are issues and deficiencies in four areas:

- The deficiencies in the understanding of the contents of the tanks and the scientific protocols associated with that;
- An inadequate assessment of whether the ALPS system will perform as required without repeated treatment of the water
- Deficiencies in ecosystem impact analysis;
- Lack of full consideration of alternatives.

# Sampling deficiencies

- Only nine of 64 radionuclides routinely sampled.
- In the data the Expert Panel saw a maximum of 19 radionuclides were sampled.
- Sampling was inadequate in quantity – just one 30-liter sample per tank group
- Sampling was unrepresentative – always taken from the last batch before tanks were full.
- Only about 20 percent of the tanks have been sampled.

# Inadequate sampling: total radionuclides = 64.

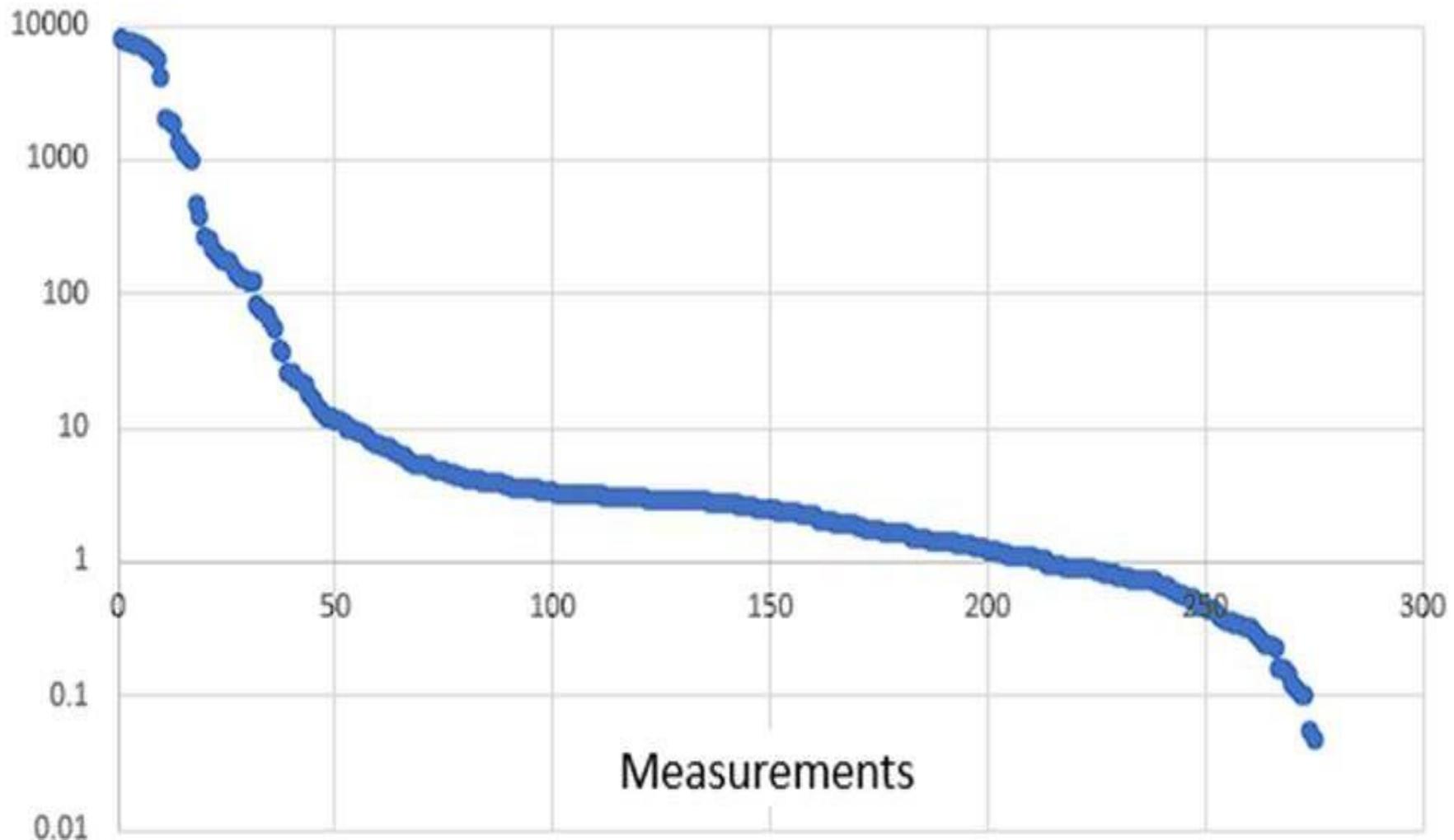


# Measurement deficiencies and uncertainties

- Large variability in Sr-90/Cs-137 ratios – so far unexplained;
- No identified measurements of impact of sludge on radionuclide concentrations, particulate concentrations;
- The problem of tellurium-127: It should have decayed away completely a couple of months after the accident – but measurements were reported in 2019.

Sr-90/Cs-137 unexplained variability. Is there a problem with ALPS treatment? Irregular performance? Varied sources of water?

Sr-90/Cs-137 for ALPS Treated Water



# Will ALPS work well?

## Potential for difficulties with ALPS

- High variability in Sr-90/Cs-137 ratios
- Presence of sludges
- Potential stirring up of particulates in tanks with sludges when water is pumped out

Such problems may result in multiple passes being required – raising cost, creating delays, and risking system breakdown.

Plan: 40 years of discharges. Could it run to 80 years?

It is risky to decide to proceed without adequate knowledge of the source term. And TEPCO's knowledge if not adequate.

# Inadequate ecosystem assessment

- Organically bound tritium (OBT) has been ignored in the TEPCO environmental assessment.
- The assumption that OBT will behave the same as a tritium impact on humans when it is in drinking water is wrong.
- Bioconcentration of radionuclides, notably strontium-90 is not well considered.
- Intergenerational and transboundary impacts are not given due attention.

# Alternatives

- While some alternatives were considered, some critical ones were not.
  - ▣ ALPS treatment followed by storage in seismically safe tanks – different than just continued storage. ALPS+ storage in safe tanks would allow storage to decay and consideration of alternatives such as the next two.
  - ▣ ALPS treatment + use of water to make concrete that has little potential for human contact.
  - ▣ Bioremediation.

In all of these impacts would be orders of magnitude lower and transboundary impact would be avoided.

TEPCO and Japan have refused to consider even after Expert Panel proposed that they be studied.

Expert Panel was disappointed at the lack of attention to critical issues by the IAEA.

# Questions?



End