

# 900,000 tons of Water stored at Fukushima nuclear plant still too radioactive to release to the ocean

Background

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Irradiated nuclear fuel is millions of times more radioactive than fresh nuclear fuel, due to the hundreds of varieties of human-made radioactive elements that are created during nuclear fission, many of which remain trapped in the irradiated fuel. See [www.ccnr.org/hlw\\_chart.html](http://www.ccnr.org/hlw_chart.html) .

Irradiated fuel is so fiercely radioactive that it generates more than enough heat to melt the core of a nuclear reactor, just by the ongoing disintegration of radioactive atoms, even after the fission process has been completely stopped. Continual cooling of the core is essential after shutdown.

As soon as the 2011 Japan earthquake happened, all three operating reactors at Fukushima Dai-ichi were shut off immediately . But nobody knows how to shut off radioactivity. The heat generated by the radioactive waste inside was what melted the cores of those three shut-down reactors at a temperature more than twice the melting point of steel. Lack of backup electricity resulted in lack of cooling. Overheating occurred, and meltdowns soon followed.

Those melted cores are still there, lodged somewhere in the sub-basements of the reactors. The melted fuel still has to be cooled, even seven and a half years after the accident.

Normally, when irradiated fuel is removed from an operating reactor, it is placed in a large pool of circulating water for about ten years. Cooling in such a pool is necessary to allow time for radioactivity levels to drop to the point where irradiated fuel no longer needs forced cooling to prevent spontaneous overheating.

Every day for the first several years following the triple meltdown, hundreds of tons of water were pumped down into the melted cores and back up again, in order to cool the melted fuel – to prevent it from overheating again, releasing even more radioactivity into the atmosphere and groundwater.

By the time the water was pumped back to the surface it had become extremely radioactive, heavily contaminated with radioactive poisons that were flushed out of the melted reactor cores. Every day, new steel tanks had to be built at the surface to hold the highly contaminated water – much too radioactive to disperse into the ocean or the local environment. A small forest had to be cut down to make room for even more tanks to hold the radioactive waste water.

Today there are more than a thousand such tanks covering large areas of land adjacent to the reactor site. These tanks hold about 900,000 tons of radioactive water. More contaminated water is being added to this dismal inventory every week, as cooling of the melted cores continues.

For years now, filtering equipment has been used to decontaminate this huge volume of water by removing over 60 varieties of radioactive contaminants. However tritium (radioactive hydrogen) cannot be removed from contaminated water by any readily available filtration process, because radioactive water molecules incorporating tritium are chemically identical to ordinary non-radioactive water molecules. You cannot filter water from water. The tritium remains.

So even if all other radioactive contaminants were totally removed, the 900,000 tons of water in storage would still remain heavily contaminated with tritium. For the last couple of years, experts from the nuclear industry have wanted to dump this contaminated water into the Pacific Ocean, claiming that tritium is not one of the most dangerous of radioactive materials.

Tritium gives off no penetrating gamma radiation, but if ingested through contaminated food or water, or inhaled as radioactive humid air, or absorbed directly through the skin, tritium damages living cells. It has been well-documented that tritium is a cancer-causing agent as well as a mutagen and teratogen, altering chromosomes and genes in a random fashion and causing abnormalities in developing embryos. See [www.ccnr.org/tritium\\_1.html](http://www.ccnr.org/tritium_1.html) .

Moreover, since tritium is biologically and chemically indistinguishable from ordinary hydrogen, it gets built right into the body's organic molecules, including DNA molecules. Tritium also readily crosses the placenta, entering into the body of a developing child in the womb, resulting in the embryo having a higher concentration of tritium than the mother has.

Precisely because tritium is so difficult to control, and so easily dispersed into the air and the water around nuclear facilities, industry experts frequently advocate for lax standards and permissive practices regarding tritium. See [www.ccnr.org/GE\\_ODWAC\\_2009\\_e.pdf](http://www.ccnr.org/GE_ODWAC_2009_e.pdf) .

But Japanese citizens, especially fishermen, do not trust the industry. TEPCO has lied to them repeatedly both before and after the 2011 disaster. These people have fought hard to prevent TEPCO from dumping the contaminated water into the ocean, despite TEPCO's persistent efforts to browbeat them into submission by repeatedly insisting that tritium is nothing much to worry about.

Now it has been revealed that there are dozens of other radioactive contaminants besides tritium in the contaminated water, and that these poisons are present at unacceptably high concentrations. [See the article linked below.]

It turns out that the previous removal of more than 60 species of radioactive poisons from the water was far from perfect, in part because workers neglected to take the time or make the effort to frequently change the filters. When filters get clogged they don't work very well.

So the “tritium water” that TEPCO was prepared to dump is actually a stew of many other radioactive contaminants such as cesium-137, strontium-90, plutonium-239, iodine-129, and many many more.

Beware of industry assurances. Their experts are predisposed to protect the nuclear establishment.

Gordon Edwards.

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**By Mari Yamaguchi, Associated Press via The Toronto Star, September 28, 2018**

<https://www.thestar.com/news/world/2018/09/28/water-stored-at-fukushima-nuclear-plant-still-radioactive.html>