

[Supporting information]

- **High-level radioactive liquid waste leakage can cause a catastrophic accident**

The diagram on the right is an evaluation of the consequences of an accident in which a tank containing 100 cubic meters of high-level radioactive liquid waste is damaged and 1% (1 cubic meter) of the waste leaks to the outside environment. The entire prefecture of Aomori falls under the designated evacuation zone.

- **Active fault directly below the plant—**

**Possibility of a M8 class earthquake:**

In May of 2008, professor Mitsuhsisa Watanabe of Toyo University reported that there is a flexure structure caused by a reverse fault (see diagram to the right: difference 30m to 40m),

and that an active fault is present directly below the reprocessing plant. Professor Watanabe further states that this active fault is connects to the outer rim fault of the continental shelf, which could cause a M8-class earthquake if it moves. The energy released from an M8-class earthquake is 180 times that of a M6.5 earthquake, revealing that there is a serious issue regarding the earthquake resistance of the plant.

- **Examples of high-level radioactive liquid waste accidents overseas:**

**Example 1: High-level radioactive liquid waste reached boiling point and nearly exploded (La Hague Nuclear Fuel Reprocessing Plant, France)**

In April of 1980, a fire broke out in the power room of the La Hague Nuclear Reprocessing Plant, leading to the loss of power. High-level radioactive liquid waste could not be cooled and nearly reached boiling point. The plant requested a power supply car to be sent out from the city of Caen, 100km away, and power was finally supplied after thirteen hours. It is said that had the loss of power continued any longer, the liquid waste would have reached boiling point, leading to a hydrogen explosion, thus causing a catastrophic accident with the inevitable consequence of widespread radioactive contamination of the Northern Hemisphere.

**Example 2: Nuclear disaster in the Urals (Mayak Nuclear Fuel Reprocessing Plant, former Soviet Union)** In September of 1957, a failure in the cooling system for the high-level radioactive liquid waste tank caused a rise in tank temperature, which led to an explosion. Massive amounts of radioactive materials were released into the air. An area 9km wide and 105km long to the northeast of the plant was contaminated. 340,000 people were exposed to radiation and 10,000 people evacuated from the affected areas.

**Example 3: Accidental release of high-level radioactive liquid waste into the ocean (Sellafield Nuclear Fuel Reprocessing Plant, UK)**

In November 1983, high-level radioactive nuclear waste was mistakenly placed in a tank that releases liquid into the ocean. While the liquid waste still present in the tank was recovered, liquid waste left in the pipes was released into the ocean together with wastewater. Forty kilometers of the shoreline nearby were closed off for nine months following the accident, and seaweed can no longer be harvested in the area.

