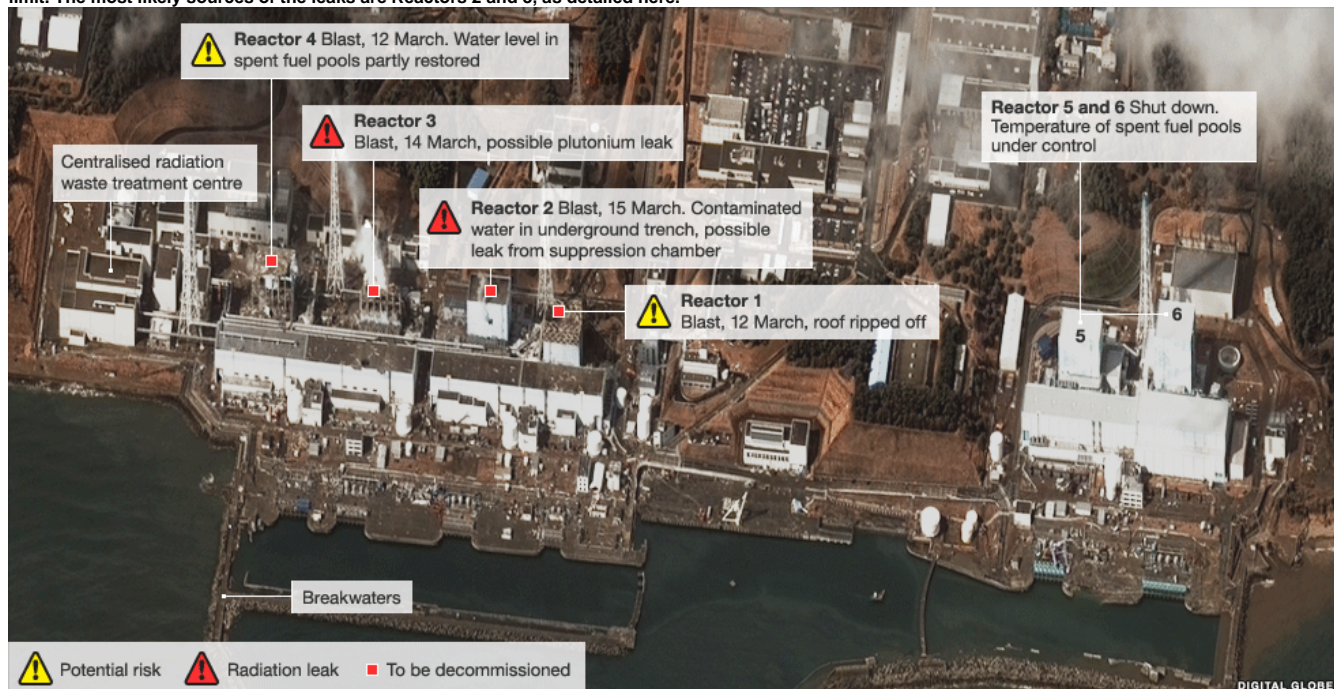


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## Japan's nuclear reactor: radioactive leaks

There has been a sharp rise in radioactive iodine in the sea off the Fukushima nuclear power plant, with radioactivity thousands of times higher than the legal limit. The most likely sources of the leaks are Reactors 2 and 3, as detailed here.



It is now believed radioactive leaks from the plant into the sea are continuous. Workers are planning to drain highly radioactive waste water from under turbine buildings of reactors 2, 3 and 4, into the **centralised radiation waste treatment centre** (labelled above). There is less radioactive water building up under turbine buildings of units 5 and 6 which threatens the safety of the reactors - this too needs to be pumped away.

But first [workers have to drain 10,000 tons of low-level radioactive water](#) currently in storage at the waste treatment centre straight into the sea to make room for the highly contaminated water.

### Theories on main sources of leaked radiation

**Reactor 2:** It is thought radioactive steam is flowing from the core into the reactor housing and is leaking through cracks in the water-filled suppression chamber beneath the reactor.

Radioactive water in a tunnel underneath the reactor and the turbine building (see diagram below) is preventing workers from gaining access. This tunnel emerges at the front of the building as a trench - just 55 metres from the sea.

On 3 April, workers at the plant poured concrete and polymers into a pit near this reactor because they had found a 20cm crack in it. They used a coloured dye to check whether they had managed to stop any flow of water into the sea, but found they had failed. It is now assumed the leak is coming from a cracked pipe which is seeping contaminated water into gravel. Liquid glass is being injected into the gravel to try and solve the problem.

**Reactor 3:** Uses more plutonium in its fuel rod mix than the other damaged reactors. Small amounts of plutonium have been found in soil at the plant indicating this reactor may have suffered a partial meltdown. Sea water is being injected into the spent fuel pool and fresh water is being injected to the damaged core. Highly radioactive water has been detected in reactor.

**Reactor 1:** Damage to the core from cooling problems. Fresh water is being injected into the core. Highly radioactive water has been detected in reactor.

#### Decommissioning the plant

The good news is that mains electric power has finally been restored, which brings effective cooling of the fuel rods one step closer.

Once that has been achieved and leaks stopped, the next step will be to decommission reactors one to four. This means removing the fuel rods, storing them and then reprocessing them at another plant. Then all non-core buildings will be demolished. Core buildings (which house the reactors) have to remain in tact for at least 40 years because dismantling them would release more radioactive material. Some Japanese nuclear experts are considering whether to cover those core buildings with a special material to stop the spread of radioactive substances.

**Reactors 5 and 6** would re-open at some point after consultation with local residents.

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