

How a nuclear plant meltdown could unfold

An explosion at an earthquake-hit nuclear plant in Japan has sparked fears of a radiation leak and nuclear meltdown. A meltdown occurs when failure of the cooling system leads to fuel rods overheating and melting

Boiling Water Reactor, BWR:

Water, heated by splitting of uranium atoms, turns to steam and drives turbine-generator to make electricity. Steam condenses back to water and is pumped back into the reactor to continue cycle.

There are multiple barriers to prevent release of radiation

1 Metal cladding:

Encases uranium fuel rods in reactor core

2 Reactor pressure vessel

3 Containment building

Reactor scram: During earthquake, reactor automatically shuts down

4 Control rods: Hydraulically driven into core within 7 seconds

5 Emergency cooling: Diesel generators power emergency cooling. **Failure produces more heat, increases pressure**

6 Wet well: Pressure relief systems active at about 1,100 psi. If reactor pressure gets too high, relief valves open and discharge steam to water filled pool inside containment

7 Meltdown: Above 1,200°C fuel rod cladding melts, releasing radioactive isotopes of caesium and iodine into damaged containment building. Radiation escapes into environment

