

FUEL ROD

Thousands of thin, 180cm-long fuel rods, made of zirconium alloy, submerged in water inside pressure vessel

Fuel pellets: Uranium dioxide or mixed oxide (MOX fuel) – blend of plutonium and uranium

Scram: Following loss of power to pumps after earthquake, control rods hydraulically driven into core, stopping nuclear fission within seconds

Normal water level

Exposure: Water boils off and fuel rods are exposed. **Zirconium alloy rapidly oxidises in steam, producing explosive hydrogen gas**

Washout: As rods crack apart, fuel pellets fall out. **Radioactive isotopes in fuel – iodine and caesium – escape**

Recirculation pump

The mechanics of a nuclear meltdown

In a partial meltdown fuel rods become damaged, allowing the release of some radioactive elements in the fuel. But in a full meltdown – if all cooling water is lost and the rods become completely uncovered – thousands of fuel pellets fall to the bottom of the reactor and heat themselves into a molten pool, threatening to breach the pressure vessel

Secondary containment building: Outer buildings around reactors 1, 2, and 3 destroyed by hydrogen gas explosions

Spent fuel storage pond: Fire at reactor 4 exposes fuel rods to atmosphere

Primary containment: Damaged at reactor 2

Reactor pressure vessel

Fuel rods

Wet well

Secondary containment building

Control rods

Wet well: Circular tank half-filled with water is being used to relieve pressure in reactor

Emergency flooding: Seawater, laced with boric acid to quench fission, pumped into containment in bid to cool reactor and stop meltdown