

NO. 2

A series of fires and explosions has rocked the Fukushima nuclear plant, but on Tuesday engineers said reactor No. 2 was the most dangerous following a crack in the containment vessel.

A SUCCESSION OF FAILURES

The quake triggered sensors in the reactors and they automatically shut down. Nuclear fission stopped but heat inside the reactors remained dangerously high.

Electricity running the cooling water pumps was knocked out by the quake. The plants then switched to back-up diesel generators.

The diesel generators were then disabled by the tsunami. The plants then switched to emergency battery power.

The batteries could only be run for an eight hour period, and so were not a long-term solution.

In a last ditch attempt to solve the overheating, the three reactors were filled with a mixture of seawater and boric acid.

Engineers then vented some of the reactors to release pressure and steam caused by the seawater infusions.

Turbine buildings
Electric cooling system generators

Reactor buildings

■ No. 1 - Saturday: A build-up of hydrogen caused an explosion. The building was damaged but the steel surrounding is intact. The containment vessel was not breached. However, officials suspected a partial meltdown of the core.

■ No. 3 - Monday: A similar explosion happened at No. 3 reactor. Walls were blown out but the containment vessel was intact. A partial meltdown was suspected.

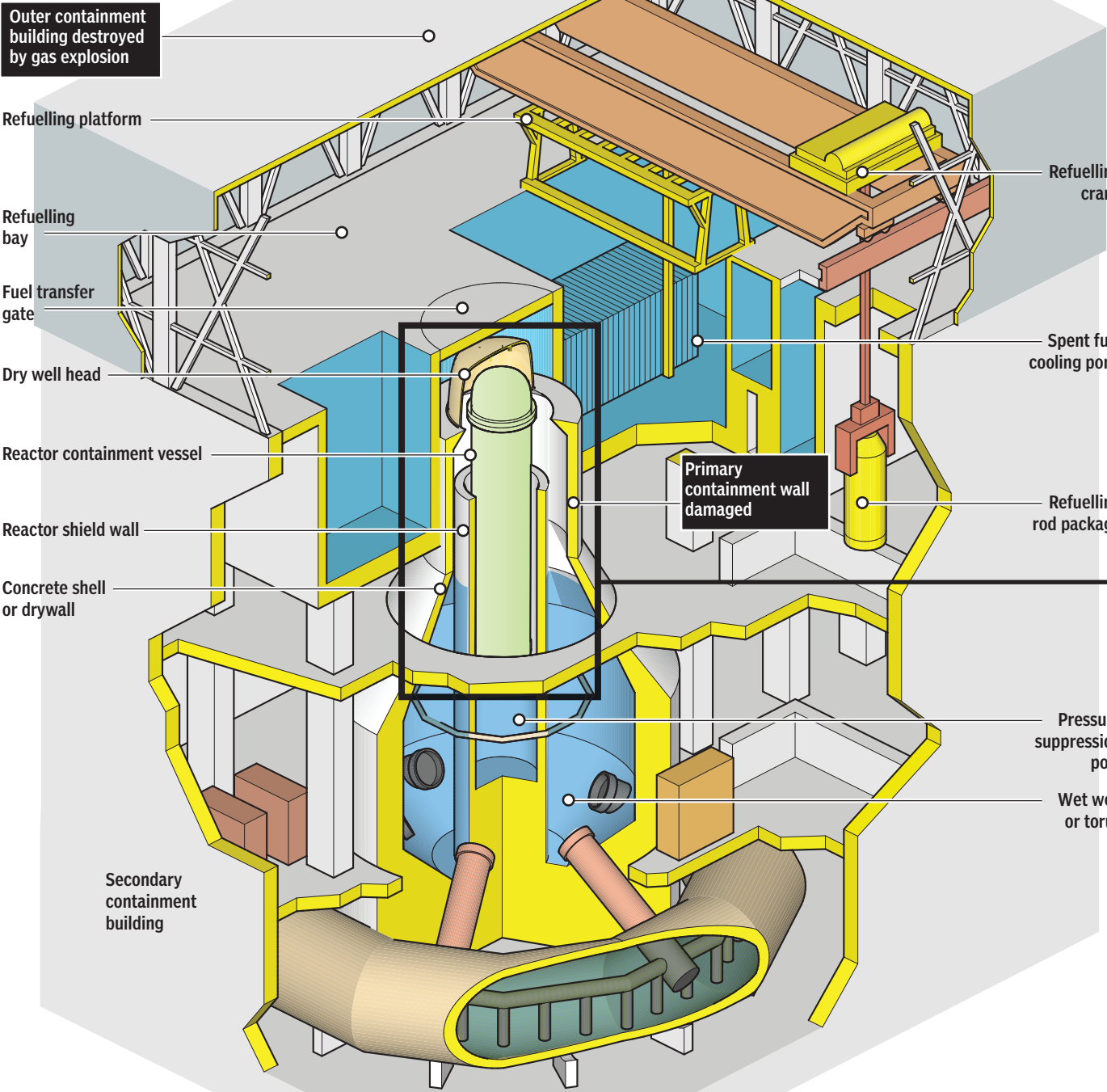
■ No 4 - Tuesday: A fire started in the reactor. The Prime Minister's spokesman Noriyuki Shikata said there had been "a sign of leakage." The fire was put out and Mr. Shikata said the fuel did not cause the fire. The Japan Atomic Industry Forum said temperatures in the cooling ponds at reactors 5 and 6 were increasing. The reason was not known.

INSIDE REACTOR 2

On Tuesday morning an explosion at the reactor was heard. Government officials said they believed the containment vessel had been breached leading to fears of a serious radiation leak. Japan's Nuclear and Industrial Safety Agency said "the suppression chamber may be damaged." Radiation levels on the edge of the plant compound briefly spiked at 8.2 milliSieverts per hour. A

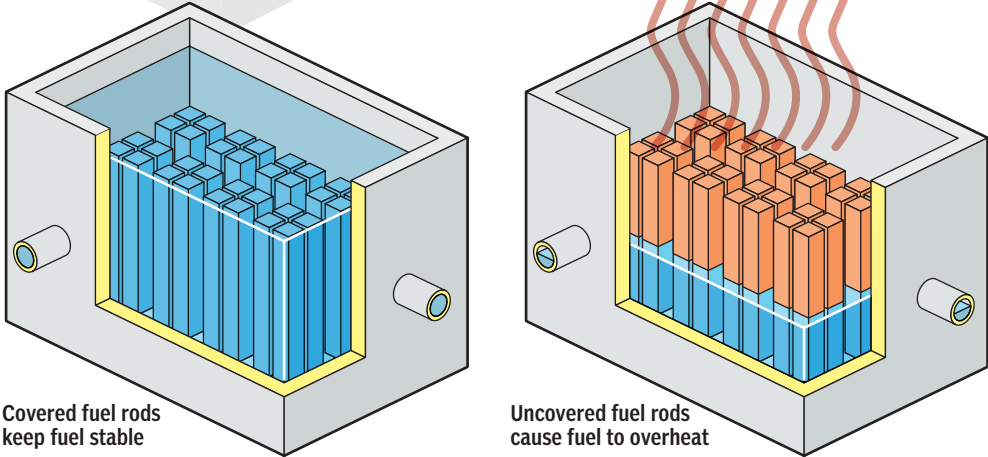
milliSievert (mSv) is a unit that measures the biological effects of radiation absorbed by the human body. Japanese authorities told the International Atomic Energy Agency (IAEA) that radiation levels at the plant site between reactors 3 and 4 reached a peak of 400 mSv per hour. "This is a

high dose-level value, but it is a local value at a single location and at a certain point in time." Relocated Chernobyl residents were exposed to levels of 350 mSv. At Fukushima, later readings were 11.9 mSv per hour, followed six hours later by 0.6 mSv, which the IAEA said "indicate the level of radioactivity has been decreasing."



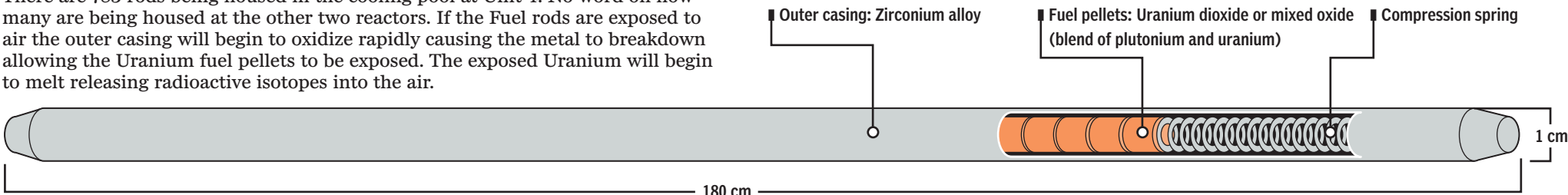
THE COOLING POND AT REACTORS 4,5 & 6

Reactors 4, 5 and 6 were not online at time of quake, but were subject to severe shaking. They were being used to store used fuel assemblies in "cooling ponds" because they also need to be covered in water to remove "decay heat." However, an explosion and fire broke out in reactor No. 4 on Tuesday. It was doused but fire broke out again on Wednesday for unknown reasons. Officials are considering using a helicopter to pour more water on the cooling ponds.



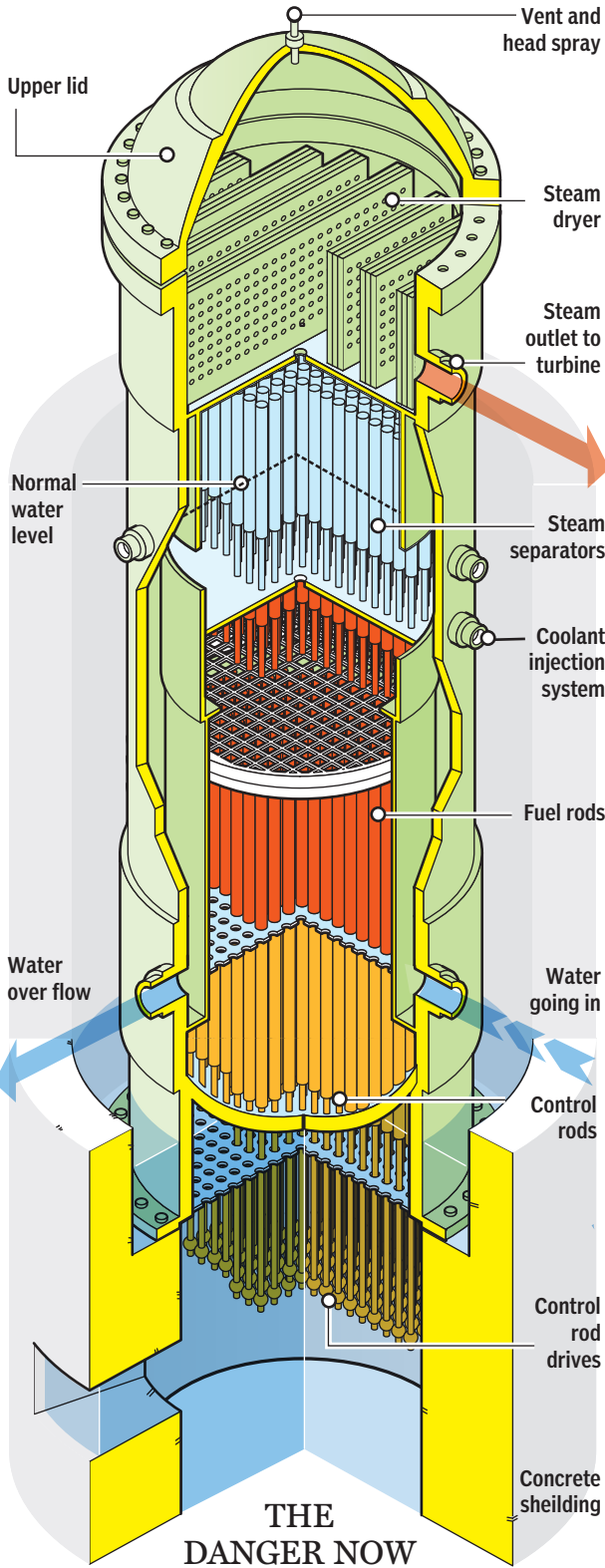
FUEL ROD DANGER

There are 783 rods being housed in the cooling pool at Unit 4. No word on how many are being housed at the other two reactors. If the Fuel rods are exposed to air the outer casing will begin to oxidize rapidly causing the metal to breakdown allowing the Uranium fuel pellets to be exposed. The exposed Uranium will begin to melt releasing radioactive isotopes into the air.



REACTOR 2 CONTAINMENT VESSEL

The fuel rods were exposed after the water level fell. Engineers tried to restore the water level but problems with a pressure gauge left rods exposed for several hours.



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 became 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

