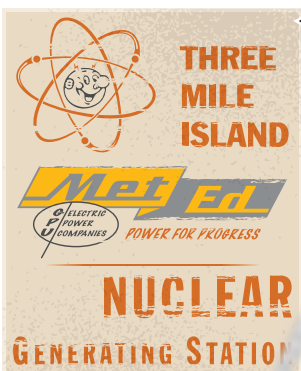
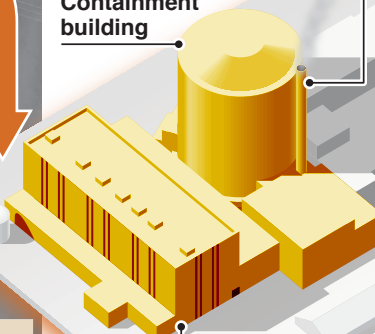


Three Mile Island to close

Four decades after a partial meltdown of a nuclear reactor at the Three Mile Island power plant in Harrisburg, Pennsylvania, the troubled plant is to be closed down



Containment building



Turbine building



◀ 1970s: United States riding swell of enthusiasm for nuclear power – then viewed as perfect energy source, cheaper and cleaner than coal

Vent stack:
Releases radiation



Unit 1: Still powering 800,000 homes

Damaged nuclear waste sent by rail to be stored at Idaho National Engineering Laboratory



HOW HUMAN ERROR, DESIGN DEFICIENCIES AND COMPONENT FAILURES CAUSED NEAR CATASTROPHE

1. Mar 28, 1979 – 4am: Pump stops circulating water coolant through reactor (running at 97%). System overheats and computer shuts it down

2. Pressure Operated Relief Valve (PORV) opens automatically to vent pressure but fails to close when pressure normalises

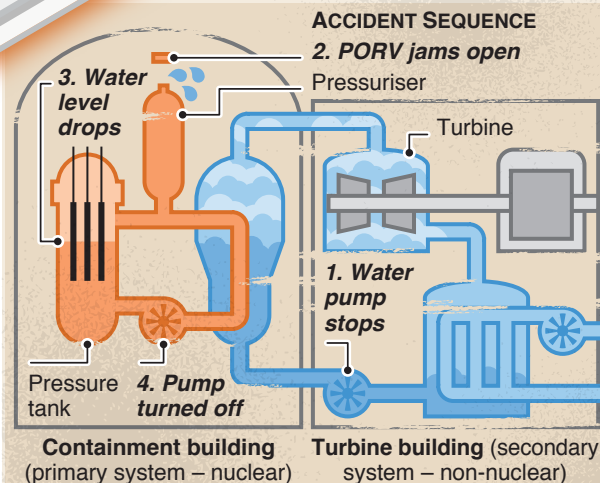
Control room instrument wrongly indicates PORV has closed, when in reality radioactive steam and water are escaping

5am: Gauges falsely show water is filling pressure tank, potentially bursting cooling system – event known as **going solid**

3. Water level is actually dropping as reactor heats up and vaporises liquid (there is no control room instrument to show water level inside pressure tank)

4. Supervisor turns off reactor water pumps, thinking it will prevent it going solid – instead makes matters far worse

6am: Worker discovers stuck PORV – **113,000kg** of coolant has evaporated or leaked into plant basement. Parts of reactor are **2,200°C** but operators are unaware as core monitoring meters only read up to **370°C** (if core reaches **2,760°C**, it will melt through containment building and reach outside)



Babcock & Wilcox (B&W, reactor designers) try to contact TMI control room but its single phone line is constantly busy

7:30am: Station Manager **Gary Miller** declares state of emergency

11am: Radiation leak outside plant detected

Levels inside reactor containment building reach **10,000 rems[†]**

7:30pm: B&W tell workers to restart pumps to send water through core again. Reactor finally stabilises. **There are no fatalities**

In following days, build-ups of toxic gas are vented into atmosphere to alleviate growing pressure inside

Apr 27: Cold shutdown achieved – reactor core being cooled by natural movement of water

September 30, 2019: Still functioning (but loss-making) Unit 1 scheduled to permanently close down
2040: Entire plant to be decommissioned, when Unit 2 radioactive decay levels have decreased sufficiently

Sources: U.S. NRC, GOA, Union of Concerned Scientists, History, World Nuclear Association, Encyclopaedia Britannica, ABC, StateImpact Pennsylvania, AP, Google Maps Picture: Apple Maps *Residents received radiation dose about 1 millirem higher than usual background dose (area's natural radioactive background level is about 100-125 millirem per year) [†]Unit of radiation dosage (humans can safely be exposed to 5 rems per year) © GRAPHIC NEWS