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JUNE 19, 2024



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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

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

Nuclear fallout*

Unit 1: Still powering 800,000 homes

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

1000km 600 miles

ACCIDENT SEQUENCE

1. Water pump stops

2. PORV jams open

3. Water level drops

4. Pump turned off

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

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)

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

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

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

11am: Radiation leak outside plant detected

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

Graphic shows events at Three Mile Island on March 28, 1979.

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ACCIDENTS

Three Mile Island nuclear plant is closing for good

BY NINIAN CARTER

September 30, 2019 - Forty years after the worst commercial nuclear power plant accident in U.S. history, the only reactor still operating at Three Mile Island (TMI) is to be shut down on September 30.

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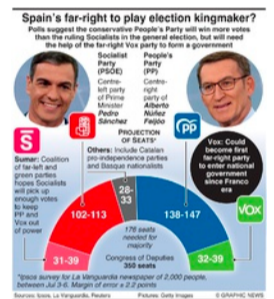
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The nuclear accident caused the partial meltdown of TMI's reactor number 2 and subsequent radiation leak that occurred on March 28, 1979. It was the most significant accident in U.S. nuclear power plant history.

It began with failures in the non-nuclear secondary system, followed by a stuck-open pilot-operated relief valve in the primary system, which allowed large amounts of nuclear reactor coolant to escape. Plant operators failed to recognise the situation as a loss-of-coolant accident, compounding the mechanical failures.

Radiation was then purposefully released into the air to relieve pressure within the system, triggering public panic.

The accident crystallised anti-nuclear safety concerns among activists and the general public and resulted in new regulations for the nuclear industry.

Although the partial meltdown was not as damaging as the nuclear crises at Chernobyl or Fukushima, people expressed worries about environmental health effects from the accident. Subsequent studies found a slight increase in cancer rates around the plant but concluded there was no causal connection linking the incident with these cancers.

The bill for making the site safe was \$1 billion from 1979 to 1993. The plant's owner, Exelon Corporation, estimates the cost of decommissioning the site costing a further \$1.2 billion. Dismantling the structures will not begin until 2074 when radiation levels have fallen.

SOURCES

- [Backgrounder on the Three Mile Island Accident \(U.S. Nuclear Regulatory Commission\)](#)
- [Nuclear plant accidents: Three Mile Island \(Union of Concerned Scientists\)](#)
- [Three Mile Island Accident \(World Nuclear Association\)](#)
- [Mar 28, 2019: Nuclear power industry still hurting 40 years after Three Mile Island accident \(NewsAhead\)](#)

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