

CHERNOBYL

JUST THE FACTS

Certain incidents at nuclear power reactors influence society's perception of the technology. Questions frequently focus on four: SL-1 in Idaho (1961), Three Mile Island in Pennsylvania (1979), Chernobyl in Ukraine (1986) and Fukushima in Japan (2011). Each event was unique and revealed lessons that improved nuclear energy safety throughout the Western world. Yet overall, few events in human history have generated reactions so disproportionate to the actual risk.



Chernobyl is the name of the nuclear power station near the city of Pripyat in what is now Ukraine, which at the time was a part of the Union of Soviet Socialist Republics (USSR).

What happened?

Chernobyl is widely considered the world's worst nuclear disaster. On April 26, 1986, operators conducted a loss-of-power cooling test on Reactor #4. During the test, managers ordered them to violate safety protocols. Attempts to shut down the reactor exposed a design flaw that triggered a power surge, causing two explosions. The cover plate and containment function failed, and the resulting fire was not contained until 10 days later.

The reactor was designed in classic Soviet fashion: gigantic, cheap and unsophisticated. The emphasis was on production, not safety. Managers ignored safety rules laid down by engineers so production quotas could be met. Workers and lower-level managers were afraid to raise objections when they saw something wrong.

— Longtime New York Times reporter Matt Wald writing for the Nuclear Energy Institute.

How many people died?

- 2 workers died from the initial explosion
- 1 employee died from cardiac arrest
- 28 first responders and operators died in the first few months from Acute Radiation Syndrome (ARS)

(Source: International Atomic Energy Agency)

Estimates of how many people died indirectly from Chernobyl vary widely. However, there is some consensus around the United Nations Scientific Committee on the Effect of Atomic Radiation (UNSCEAR) calculation that **54** people – including the **31** above – lost their lives.

How many were exposed to radiation?

Estimates vary widely. However, the number is likely in the thousands, as modest levels of radiation made it to other countries. In fact, it was authorities in Sweden who first reported the Chernobyl accident after seeing radiation spikes in the atmosphere – forcing officials in the Soviet Union to admit there had been a major accident. The UNSCEAR reported in 2018 that approximately 5,000 cases of thyroid cancer were attributable to radiation from Chernobyl. The most affected countries were Ukraine, nearby Belarus and Russia.

Other impacts

134 first responders diagnosed with ARS. Over 70% of them survived more than 12 years after the explosion, though with varying disabilities.

In 2016, the World Health Organization reported evidence of increased cataracts and fatal cardiovascular disease in the cleanup workers.

(Source: United Nations Scientific Committee on the Effect of Atomic Radiation)

Status today

On July 10, 2019, Ukrainian President Volodymyr Zelensky officially designated

what was the Chernobyl exclusion zone as a tourist destination, expanding an area that had opened to tourists in 2011. Visitors are restricted from certain areas and go through radiation detectors to ensure their health and safety.

The zone also has become a biologically diverse wildlife sanctuary inhabited by brown bears, bison, wolves, lynx, Przewalski's horses, and more than 200 bird species, among other animals. Some insects in higher-radiation areas of the zone have shorter lifespans, and there are higher-than-normal percentages of certain bird types that are albino.

150 mostly elderly people refused to move and still live in the exclusion zone. Remediation work continues today.

The other three reactors at Chernobyl were all shut down by 2000.

Key lessons

The Chernobyl disaster resulted from an unsafe design, operator error, poor management, inattentive oversight, a cavalier approach to safety and human arrogance. The RBMK reactor design, which focused on energy production over safety, has never been allowed outside the former USSR.

Societal reactions

Germany and Sweden pledged to abandon or phase out nuclear programs before people understood the unique causes of events at Chernobyl. Nine other nations canceled or delayed nuclear reactor construction but some, particularly in China and the UK, resumed building once the causes were better understood. Chernobyl contributed to mistrust of Moscow and demise of Soviet Union; in December 1991, a Ukraine referendum led to its exit from the USSR. Gorbachev said Chernobyl was more important to the fall of the USSR than Perestroika (economic reform).

Pop culture

HBO network aired "Chernobyl," a 5-part mini-series, in 2019. It was widely watched and nominated for 19 Emmy awards. While largely considered an accurate portrayal of how the Soviet Union operated, its presentation of certain aspects of nuclear power generation – particularly radiation – was severely flawed.

For more information, visit <https://inl.gov/trending-topic/hbo-chernobyl-miniseries-inl/>.

Sources

<https://www.iaea.org/newscenter/focus/chernobyl/faqs>

https://www.unscear.org/docs/reports/2008/11-80076_Report_2008_Annex_D.pdf

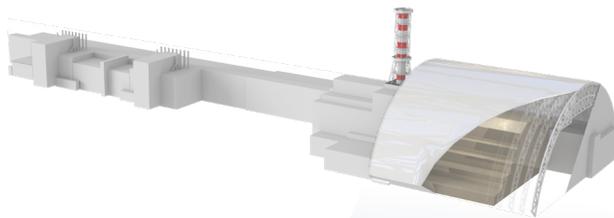
<https://www.unscear.org/unscear/en/ Chernobyl.html>

<https://theconversation.com/ Chernobyl-has-become-a-refuge-for-wildlife-33-years-after-the-nuclear-accident-116303>

<https://www.ebrd.com/what-we-do/sectors/nuclear-safety/ Chernobyl-new-safe-confinement.html>

Other facts

The New Safe Confinement was built as a cover to contain the remains of Reactor #4.



Designed to contain radiation

World's largest movable metal structure

Weighs more than 35,000 metric tons

Site work started late 2010, moved into position November 2016, construction completed 2018.

Approx. 354 feet tall (the Statue of Liberty is 305 feet)

Cost \$2.5 billion

Paid for via a special fund of the European Bank for Reconstruction and Development

45 countries contributed to the fund

