

Lessons of Chernobyl disaster, 30 years on

April 20 2016, by Simon Sturdee



A man walks past the Chernobyl New Safe Confinement structure (NSC) under construction in Chernobyl, Ukraine on January 22, 2016

Ukraine next week marks the 30th anniversary of the Chernobyl disaster, when human error and flawed Soviet reactor technology led to the world's worst nuclear accident.

Ahead of the April 26 anniversary, AFP looks at the steps taken since 1986 to improve nuclear safety around the world and—as Fukushima showed in 2011—the challenges that remain.

Only in the USSR?

Experts say a big factor behind the disaster was the unusual and poor design of the reactor, known as RBMK, particularly its propensity to sudden power surges—as happened at Chernobyl.

In addition, and unlike elsewhere outside the Soviet Union, there was no containment structure shielding the reactor to stop radioactivity escaping.

But there was also [human error](#). According to the World Nuclear Association, the accident was also due to "the violation of operating procedures and the absence of a safety culture".

The aftermath was also poorly handled, with officials slow to evacuate locals and Moscow sending 600,000 "liquidators" with little or no protective gear to put out a fire that raged for 10 days.

The first alarm was raised on April 28, 1986, not by Russia but by Sweden after it detected an unexplained rise in radiation levels. Soviet leader Mikhail Gorbachev did not admit the disaster had occurred until May 14.



A general view taken from a helicopter in April 1986 shows the destroyed fourth power block of Chernobyl's nuclear power plant few days after the nuclear catastrophe

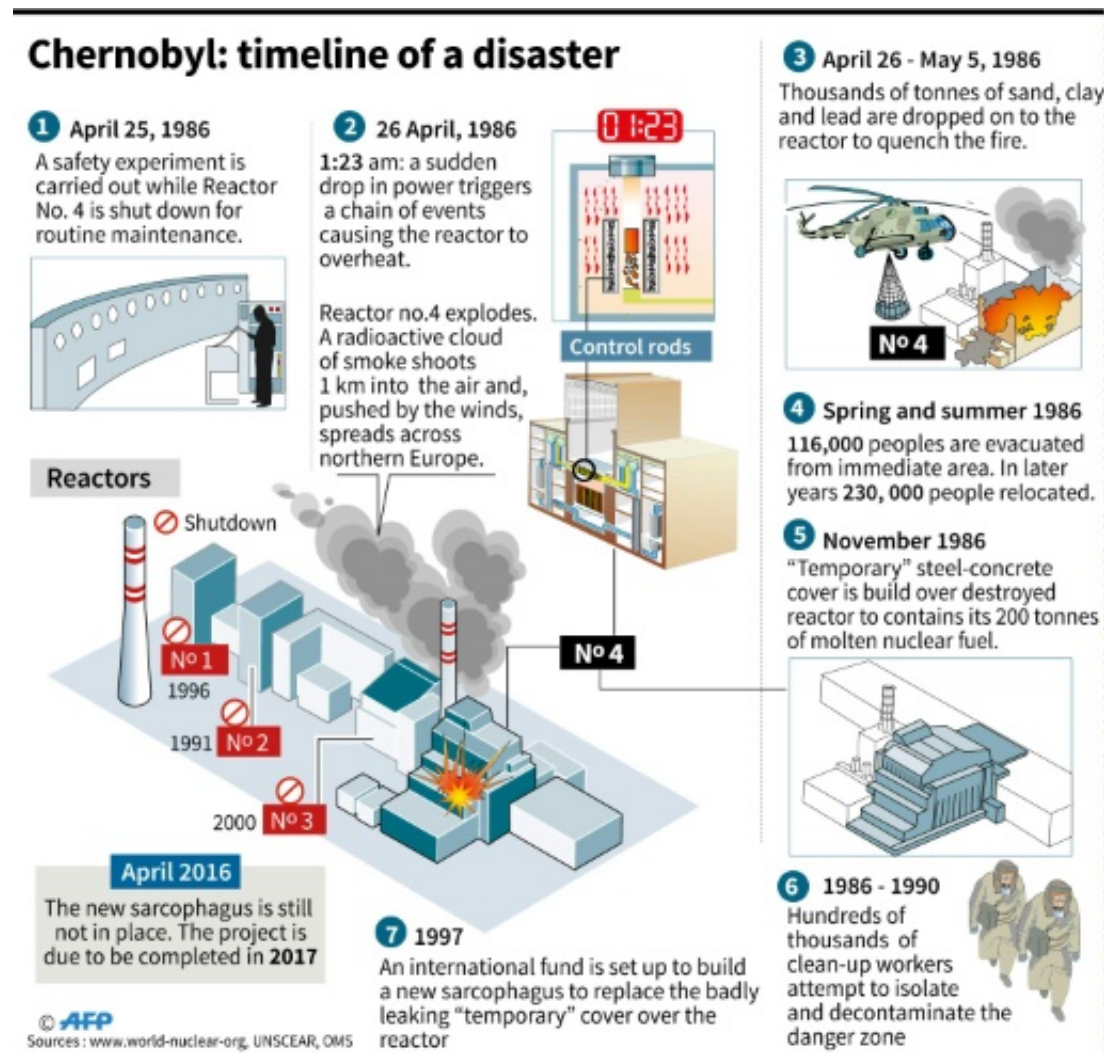
The response

With enormous public outrage around the world Chernobyl, suddenly a household name, spurred an international push— even overcoming Cold War divisions—to improve atomic safety and reassure the public.

One of the most important steps was the 1989 creation of the World Association of Nuclear Operators (WANO), which carries out "peer reviews" of 430 reactors around the world to detect problems.

"The industry has undoubtedly learned the lesson that we are stronger together," WANO chief executive Peter Prozesky told AFP.

The demise of the Soviet Union and the end of its Cold War isolation has also removed barriers to international cooperation.



A general view taken from a helicopter in April 1986 shows the destroyed fourth power block of Chernobyl's nuclear power plant few days after the nuclear catastrophe

Ex-communist eastern European countries, many now EU members, have also been helped to adapt their Soviet-built plants. Of the 17

RMBK reactors in operation in 1986, six have been permanently shut down.

In addition the role of the UN nuclear watchdog, the International Atomic Energy Agency was beefed up. It expanded and revised safety standards and member states were required to report swiftly any incidents with potential cross-border effects.

A number of international agreements were signed, the most important being the IAEA Convention on Nuclear Safety (CNS). Others covered nuclear waste and early warning systems for accidents.

What about Fukushima?

But any belief that enough had been done was swamped by the tsunami that knocked out the power supply and cooling systems of three reactors at the Fukushima Daiichi nuclear plant on March 11, 2011.



The Chernobyl nuclear power plant is seen in the distance from the ghost city of Prypyat on April 8, 2016

"It was the belief in Japan at that time that this facility was robust... and even that it was not a good idea to conduct upgrades or changes to the facility because this could demonstrate in terms of public communication some weaknesses," Juan Carlos Lentiño, head of [nuclear safety](#) at the IAEA, told AFP.

"This was an acute error, a huge mistake."

This, the worst nuclear accident since Chernobyl, also caused an outcry, further international cooperation and agreements, and an even bigger role for WANO and the IAEA.

Nuclear plant operators again say that they have made more technical improvements, including through better shielding of the nuclear material and more reliable "passive" safety systems in newer reactors.



The 2011 earthquake and tsunami caused a meltdown at the Fukushima nuclear reactor and spread radiation over a wide area

Human error

But for critics, dangerous risks remain, not least because no matter how many technical and regulatory improvements are made, the risk of human error—the common factor at Chernobyl and Fukushima—remains.

According to the Union of Concerned Scientists, there were 10 "near misses" at US reactors in 2015, events that potentially increase the risk of a meltdown by at least 10 times, most due to human error.

For Shawn-Patrick Stensil, a nuclear expert at Greenpeace, the biggest risk is that most reactors, particularly in the West, are decades old, their designs dating back to the 1960s and 70s.

"We are now in the wear-out stage for the majority of the reactors in the world," Stensil told AFP.

In addition, these reactors were all built before another risk that has reared its head in recent years—nuclear terrorism—"was even thought about," Stensil said.

There are also lingering concerns about Russia—there are still 11 RMBK reactors, albeit with new safety features—particularly with Russia being a big exporter of [reactors](#) to the developing world.

But Lentijo of the IAEA, whose raison d'etre is to promote nuclear technology, is more positive.

"Safety has been improved, and I would say that the level is appropriate in general terms," he said.

© 2016 AFP

Citation: Lessons of Chernobyl disaster, 30 years on (2016, April 20) retrieved 23 April 2024 from <https://phys.org/news/2016-04-lessons-chernobyl-disaster-years.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--