



OUT OF CONTROL

By Charles Apple | THE SPOKESMAN-REVIEW

On April 26, 1986 — 40 years ago — a reactor at a Soviet nuclear power station 80 miles from Kiev — now Kyiv, Ukraine — exploded. Much of the radioactive core was vaporized, thrown into the atmosphere and spread across Europe.

Nearly a quarter-million people were forced to resettle elsewhere from land that will be poisoned for centuries.

HISTORY’S WORST NUCLEAR DISASTER

In early 1986, operators at the Chernobyl nuclear power plant discovered during a test that they could draw power from the inertia of their spinning turbine generator, even after the reactor had been taken offline.

For how long could they do this? No one knew. Another test was ordered.

In the early morning hours of April 26, 1986, that test went horribly wrong. With safety protocols bypassed and the emergency core-cooling system turned off, the No. 4 reactor began behaving erratically. Supervisors ignored the warning signs and ordered the test go on.

The reactor became overheated, boiling the coolant water inside. When operators tried to halt the reaction by inserting all the control rods — which absorb neutrons and slow a nuclear reaction — they found the rods wouldn’t slide back into the reactor properly. The out-of-control reaction ruptured reactor No. 4, and an enormous steam explosion blew the 1,100-ton concrete top off the reactor.



EPA

Radiation levels in the nearby city of Pripyat, Ukraine, are still ten times higher than normal. Vegetation and some animals have returned to the abandoned city.

This, in turn, ruptured the nuclear fuel rods themselves. A second explosion then tossed 50 tons of radioactive graphite and nuclear fuel — in the form of dust — into the atmosphere and exposed reactor No. 4’s core to the open air ... and to firefighters and technicians.

The resulting fire burned for 10 days. Two workers were killed that night

and 26 more plant employees and firefighters died from radiation burns over the next four months. Even a helicopter, dropping boron onto the out-of-control nuclear core, became snagged on the guy wire of a construction crane and crashed.

Another big error: Authorities waited 36 hours before evacuating 115,000 area residents on buses. Eventually,

the Soviet government would resettle 220,000 people.

Once the fire was extinguished, technicians began building what they called “a sarcophagus” to contain the still-exposed reactor No. 4. That structure was completed six months later. In 2011, that was covered by a 31-ton, \$3 billion arched covering called the New Safe Confinement structure that is designed to protect the site for 100 years.

Officials shut down Chernobyl’s reactor No. 2 after a building fire in 1991. They shut down No. 1 in 1996 and closed the final reactor, No. 3, in 2000. A fifth reactor would never be completed.

In the meantime, interest has risen in the nearby town of Pripyat, which was evacuated quickly in 1986 and is pretty much a ghost town today. Most residents were never allowed to come back for their belongings.

As the danger of radiation has subsided, people have been allowed to visit the area. In 2011, the village — or, at least, parts of it — officially became a tourist area.

THE 19 WORST NUCLEAR ACCIDENTS

The International Atomic Energy Agency ranks accidents and on a scale of zero to seven, with seven being the most severe.

Dec. 12, 1952

Chalk River
Ontario, Canada

5 A shutoff rod fails to stop the reaction. Built-up hydrogen gas explodes, damaging the reactor core. Among those who work to clean up the facility: U.S. Navy Lt. Jimmy Carter.

March 25, 1955

Sellafield
Seascale, England

5 Highly radioactive liquid is spilled during transport to a military nuclear facility. Several workers are contaminated.

Sept. 29, 1957

Kyshtym
Mayak, Russia

6 Cooling system fails at a military nuclear waste processing facility. An explosion blasts 80 tons of radioactive material into the surrounding area, contaminating 310 square miles.

Oct. 10, 1957

Windscale
Seascale, England

5 A Plutonium production reactor catches fire and burns for three days. Radioactive iodine is spread across the U.K. and northern Europe.

Jan. 3, 1961

SL-1
Idaho Falls, Idaho

4 Operators of an experimental military reactor mistakenly withdraw a central control rod, allowing the reactor to melt down and causing a steam explosion. All three operators are killed.

May 1968

Sellafield
Seascale, England

5 Radioactive material is released into the air when a filter is accidentally bypassed. The incident is discovered later during a review of data.

Jan. 21, 1969

Lucens
Switzerland

5 Fuel elements in the reactor core become corroded, blocking the flow of coolant. The fuel catches fire and coolant leaks from the reactor, contaminating the containment building.

Oct. 12, 1969

Sellafield
Seascale, England

5 Radioactive material is released into the air.

Oct. 17, 1969

Saint-Laurent
France

4 The day after a new reactor is started up, a combination of technical glitches and human error cause a loss of coolant. Two fuel elements melt down.

Sept. 26, 1973

Sellafield
Seascale, England

5 Waste zirconium reacts with solvents in an area where oxide fuels are reprocessed. The release of radiation exposes 35 workers.

Feb. 22, 1977

KS 150
Jaslovské Bohunice,
Czechoslovakia

4 An operator changing fuel rods fails to remove silica gel packs that keep the fuel dry during shipping. The reactor overheats, filling the containment building with radioactive carbon dioxide.

March 28, 1979

Three Mile Island
Harrisburg, Pa.

5 Operators fail to notice a coolant valve has stuck open. The reactor core partially melts down but a feared explosion of built-up hydrogen gas never happens.

Sept. 11, 1979

Sellafield
Seascale, England

5 A tank overflows during a routine transfer of radioactive liquid. Plutonium is released into the atmosphere.

March 13, 1980

Saint-Laurent
France

4 A plate protecting instruments becomes stuck in a channel that carries coolant to the reactor core. Three fuel elements melt down in the sister reactor to the one involved in the 1969 incident.

Sept. 23, 1983

RA-2
Buenos Aires,
Argentina

4 While rearranging fuel rods in a research reactor, an inexperienced operator causes the reactor to go critical. He dies two days later and eight more employees are irradiated.

April 26, 1986

Chernobyl
Present-day
Ukraine

7 A routine test goes wrong when the reactor core overheats and blows off the top of its containment structure. Radioactive dust is blown over much of Europe. Twenty-eight die from radiation poisoning.

Sept. 13, 1987

Goiania
Brazil

5 Radioactive cesium chloride used in radiotherapy is left in an abandoned hospital. Scavengers steal the container, hoping to sell it as scrap. At least 249 people are irradiated and four die, including the 6-year-old niece of the thief.

Sept. 30, 1999

Tokaimura
Tokai, Japan

4 Inexperienced operators at a uranium reprocessing facility accidentally cause a chain reaction in a mixing tank. Thirty-nine employees are irradiated and two die of their injuries a few weeks later.

March 11, 2011

Fukushima Daiichi
Okuma, Japan

7 A tsunami knocks backup equipment offline. Three of the plant’s six reactors melt down, releasing radioactive material into the surrounding area. Residents within a 6.2-mile radius are evacuated.