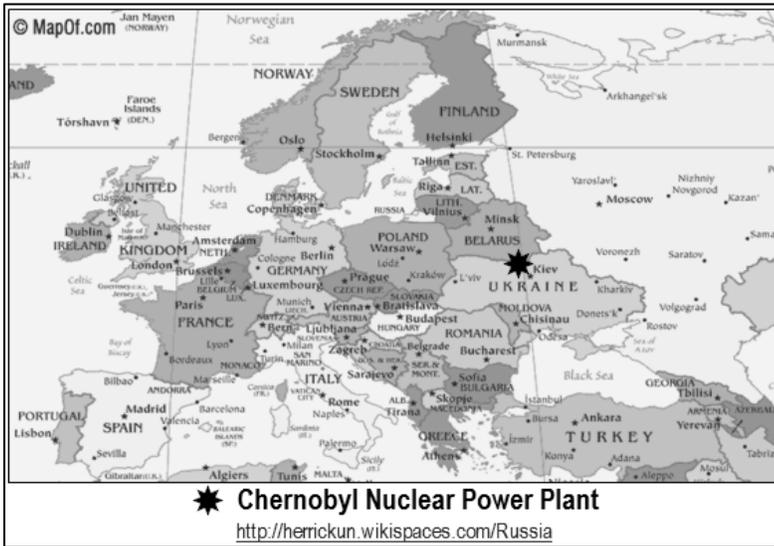


# Chernobyl Nuclear Power Plant: The Accident



Before dawn on April 26, 1986, Chernobyl Nuclear Power Plant's #4 reactor exploded.

The destroyed reactor burned for ten days. It sent radioactive smoke and clouds over the western Soviet Union and over Europe. It was the worst nuclear accident the world has ever seen.



Chernobyl aerial view, showing Reactor #4 torn open after blast

[http://tinhatranch.com/wp-content/uploads/2014/02/Chernobyl\\_Disaster.jpg](http://tinhatranch.com/wp-content/uploads/2014/02/Chernobyl_Disaster.jpg)

The firefighters who arrived first had no idea the fire was from the reactor core. They didn't know their bodies were taking on high levels of radiation. When the reactor exploded, radioactive debris was blown into the air. Before the Reactor #4 could be sealed, that dangerous debris had to be dumped back into the reactor.

The graphite on the roof was the hardest to clear. Working on the roof would mean being close to Reactor #4, which was still very hot. It was also still sending radioactive smoke in to the air.

At first, remote-control robots were used to push the debris off the roof into the reactor. But the robots soon broke down. The radiation was damaging their parts. Humans were then needed.



The high radioactivity on the roof damaged the electrical circuits of the remote-control robots

<http://tinhatranch.com/wp-content/uploads/2014/02/robot.jpg>

Because it was so dangerous, workers could only work on the roof about 2 minutes at a time. Their job was to scoop up a few shovels of waste and then run back down.



screen shot from "Chernobyl 3828" on YouTube at <https://www.youtube.com/watch?v=FfDa8tR25dk>

The radioactive fallout was 400 times worse than was released by the atomic bomb at Hiroshima at the end of World War II.

The authorities did not tell people what had happened until the following day. It was 36 hours after the explosion before the evacuation of the Pripyat -- a city of 50,000 people -- began. By that time, many residents were having symptoms of radiation sickness, including vomiting and headaches.

Citizens were given two hours to pack only what they could carry. Over 1,000 busses were brought in to take them out of the area. They were told they could return as soon as it became safe. But it has never become safe to live there.



1000 busses were used to evacuate the people of Pripyat, a city less than 2 miles from the Chernobyl explosion.  
<http://www.tiki-toki.com/timeline/entry/135449/The-Cold-War/>

The Chernobyl accident forced a third of a million people to leave their homes. An "Exclusion Zone" was set up to keep people out of the most dangerous areas.

## Health Effects



Workers with radiation sickness were taken to Moscow Hospital #6 for treatment in their isolation ward. When they arrived, they did not feel that bad. But within a few days, radiation burns started appearing on their skin, their hair started falling out, and their internal organs started showing serious radiation damage.

screen shot from "Chernobyl Uncensored" on YouTube at  
<https://www.youtube.com/watch?v=dS3WvKKSpkI>

About 600,000 people worked to clean up and control the accident. Over half of them received five times the maximum dose of radiation that workers are allowed to get.

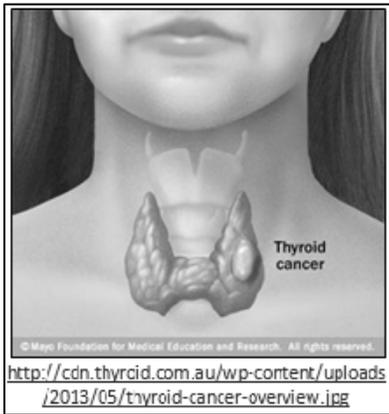
Twenty-eight clean-up workers died within four months from severe radiation sickness. Nineteen more have died since then. Many surviving workers have cataracts on their eyes and skin injuries.

Many surviving workers still have vague health problems. It is often hard for

doctors to diagnose exactly what is wrong with them. Headaches, depression, dizziness, and memory problems are common complaints. Some research suggests that the radiation has damaged the neurological systems of the workers.

Information in the preceding sections adapted from National Geographic

<http://news.nationalgeographic.com/news/energy/2011/04/110426/chernobyl-25-years-liquidators-pictures/>



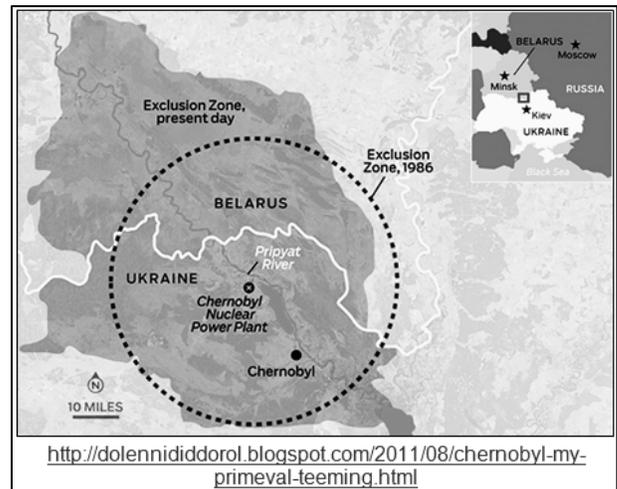
The most common health problem has been thyroid cancer. Many emergency workers have this type of cancer. But more than 5,000 cases have so far been seen in people who were children at the time of the accident and who lived in contaminated areas. This is more than ten times the normal number of cases. Most children seem to have gotten thyroid cancer from drinking milk contaminated with radioiodine. Thousands of surgeries have been performed on thyroid cancer patients. Fewer than 20 people have died from this form of cancer.

Information in the preceding sections adapted from "Chernobyl's Legacy," NATURE | VOL 471 | 31 MARCH 2011 at <http://www.nature.com/news/2011/110328/full/471562a.html>

## The Exclusion Zone

The power plant and the ghost towns of Pripyat and Chernobyl are mostly off-limits to humans. About 1000 square miles surrounding the plant -- the Chernobyl Exclusion Zone -- is also off-limits.

There are, however, exceptions: A few hundred former residents -- almost all older people -- have gone home, even though they are warned that it is dangerous. Scientists,



<http://dolennididdorol.blogspot.com/2011/08/chernobyl-my-primeval-teeming.html>



<http://www.history.com/news/slideshow-remembering-chernobyl>

government officials and other personnel are allowed on the site for official business.

Even though the site was dangerous from radiation, and even though the other reactors were the same poor quality as destroyed reactor number 4, the Soviet government kept using the Chernobyl nuclear power plant for many years. The government said their country could not survive without the electricity produced by Chernobyl. The last reactor was finally

shut down in December 2000, and that is when plant workers no longer went into the area every day.

Information in the preceding section adapted from <http://www.livescience.com/39961-chernobyl.html>

Even though only a handful of people live in the Exclusion Zone, the fields around the plant today look like some strange nature-preserve-meets-Soviet-ghost-town.

Among the species that roam the area are Przewalski horses, a wild breed that is extremely rare in Europe. In 1988 and 1989, horses were brought in to test how wildlife would handle the radioactive location. They did not die off, but grew to a herd of 100.



[http://www.slate.com/content/dam/slate/articles/health\\_and\\_science/nuclear\\_power/2013/01/130118\\_NP\\_hogsEX.jpg.CROP.original-original.jpg](http://www.slate.com/content/dam/slate/articles/health_and_science/nuclear_power/2013/01/130118_NP_hogsEX.jpg.CROP.original-original.jpg)

Now they're down to 17, but it wasn't radiation that killed them. It was poachers, along with attacks by other animals. Wolves, a rare sight in other parts of the continent, live freely in the Exclusion Zone. Wild boars, elk, deer, and bison are common also.

The Exclusion Zone looks like a fascinating dream. Buildings are overgrown with vines. Butterflies flutter above parking lots that have turned into wildflower meadows. Packs of wolves roam freely. It seems like wildlife gets along better with radioactivity than it does with humans.

## Environmental Dangers

But the takeover by nature isn't all good news. There are serious dangers.

The soil has high levels of radiation. Any crops grown in the Exclusion Zone cannot be sold without a warning label.

The forests of poisoned trees have been soaking up plutonium, iodine, strontium, and cesium. That means a forest fire would send nuclear clouds back up into the air.

Even the dead leaves that fall to the ground and the grasses and bushes that die are still radioactive. To make things worse, they are not decomposing like normal dead plants. They are taking almost twice as long to decay, which means the area is covered with a layer of dry, dead plant material that would burn rapidly.

Three hundred firemen stationed in the Exclusion Zone would be the first line of defense should any problem arise. They would follow in the tradition of the first six firemen who died in the immediate aftermath of the explosion, preventing a larger disaster.

Information in the preceding sections adapted from International Business Times at <http://www.ibtimes.com/wildlife-nuclear-wasteland-28-years-after-chernobyl-disaster-1576660>

(RL 8.1)