The Chernobyl disaster

At 1:23 am on 26 April 1986, two major explosions destroyed the nuclear reactor Chernobyl 4 in Ukraine, the Societ Union. Most of the fires started by the explosions were extinguished within hours. The fire started in the graphite reactor and could not be tamed until 9 May, causing the large and protracted release of radioactive particles. The accident happened because both the construction and the management of the reactor were inherently unsafe. Neither was there a focus on safety issues among the nuclear power plant staff. Without understanding the risks involved, the reactor operators broke the management instructions when performing a turbine test. A combination of a deficient safety regimes, technical faults and human error caused a massive disaster.

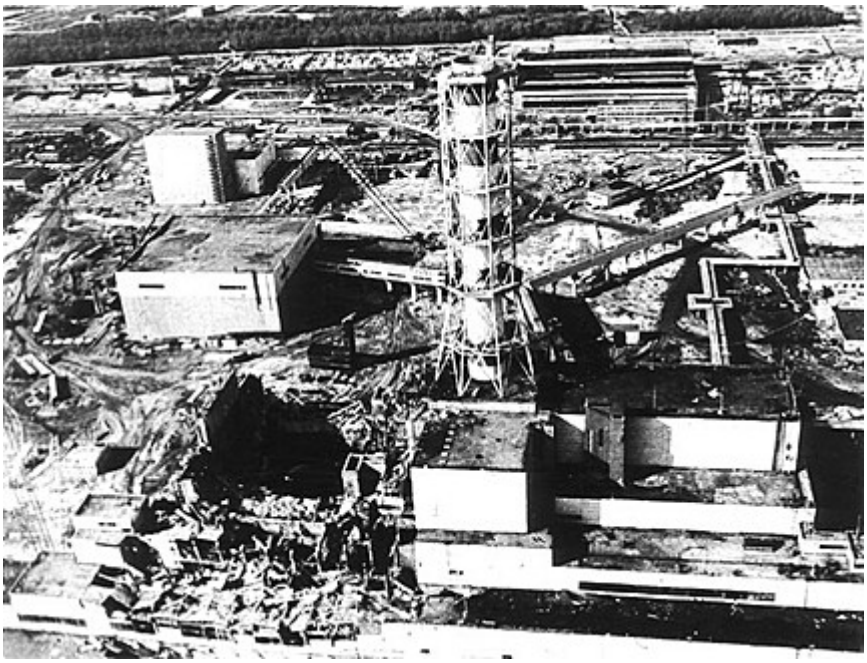
Picture: The destroyed Chernobyl Reactor 4.

The emergency stop was quickly activated, but the faulty reactor increased its activity beyond control, about one hundred times normal efficiency. The reactor fuel was heated, and as tiny fuel particles created large amounts of steam in the water, an explosion took place. A second explosion happened just a few second later. The explosions and large amounts of steam destroyed the reactor core, the upper part of the reactor as well as the roof of the reactor building. A cloud of radioactive particles spread from the building. Heavier particles fell to the ground closer to the power plant, while the lighter particles rose at least one kilometer in the air. The wind blew towards the north west, and carried radioactive isotopes, e.g. radioactive iodine and cesium long distances. The fires were eventually distinguished, and the reactor covered with concrete. By the end of 1986 the so called Sarcophagus that covers the damaged reactor 4 of Chernobyl was finished. The sarcophagus was created to last

for some 30 years, but by 1993, cracks in it were detected. It has been temporarily patched up, but needs to be replaced[1]

Environmental effects

Areas in the immediate neighborhood of the destroyed reactor were obviously most severely damaged. Large areas surrounding the nuclear power plant have been evacuated, and the areas closest to ground zero (where the accident took place) will be dangerous to visit for hundreds of years.



Picture: The area surrounding the Reactor 4 two days after the accident.
Source: Greenpeace International

Radioactive fallout from the nuclear power plant accident mainly affected Belarus, Ukraine and parts of Russia. Belarus recieved about 70 percent of the fallout, and it has been estimated thet 22 percent of the country was contaminated by radioactive cesium-137. The Chernobyl committee of the Belarus government expects that as late as 2016, about 16 percent of its territory will still be contaminated.[2] Generations to come risk being affected.

Picture: The abandoned fun park in the city of Pripyat close to the Chernobyl power plant. Source: Bosse Alenius, SSI-Info

Apart from rainwater, radioactive fallout was transported by the large rivers Pripyat and Dniepr. In Ukraine, rivers are still polluted today. Lakes and still waters, too, have high concentrations of radiation. A possible threat to the groundwater both in Belarus and Ukraine is radioactive strontium-90, which travels through deeper layers of earth much more quickly than e.g cesium-137.[3]

The Chernobyl disaster also contaminated some 18 000 square kilometers of agricultural land, of which more than 2500 square kilometers still cannot be used today. In Ukraine the forests were most severely affected: 40 percent of all forests in the country were contaminated by radioactive fallout. Dead leaves and pine needles have absorbed radioactivity and stored it in the ground. Today, the highest concentration of radioactivity can be found in berries, mushrooms, mosses and lichens.[4]

1 Statens Kärnkraftsinspektion http://www.ski.se/page/1/49.html
2 Chernobyl Info http://www.chernobyl.info/index.php?userhash=34208605&navID=17&lID=2
3 Ibid
4 Ibid