

Chernobyl Disaster

On the morning of 26th April, 1986, the unit 4 reactor at the Chernobyl Nuclear Power Plant in Pripjat, Ukraine exploded, releasing large amounts of radiation in the surrounding region. Ukraine was part of the Soviet Union then, which would have long-term consequences for the super-state in the years to come.

Along with the Fukushima Reactor Incident in Japan, The Chernobyl Disaster is the worst nuclear disaster to have occurred.

Now with the Russian invasion of Ukraine in full swing, the fate of the Chernobyl power plant hangs in the balance as the Russian army had surrounded the perimeter of the plant on 24th February 2022, preventing maintenance work from continuing.

For now this article will give details of the timeline of the events that took place on that fateful day as well as the impact of the disaster within the context of the IAS Exam.

Timeline of the Chernobyl Disaster

- On April 25, 1986, the Chernobyl Power plant had reached 50% capacity in power generation. When another power plant in the region went offline, a request was made in the afternoon of April 25 and further power down was allowed after 10 PM.
- At 12:05 AM on April 26, the power was at around 23%. 30 minutes later the power fell to a near-zero level, probably due to a change of regulator.
- At 01:00 the power stabilized to 6% and it was decided that the test would be run at that level.
- Everyone went to their instruments and at 01:23:04 the turbine generator run down test began. Everything went completely normal.
- At 01:23:40 the Senior Reactor Chief Control Engineer L.F. Toptunov pressed the emergency shutdown button as planned to end the test.
- Instead of the plant shutting down, there was a power surge which jumped from 7% to 17%. The power surge continued beyond normal levels as a result, the automatic control rods suffered damage and they jammed.
- At 01:23:47 AM, the fuel channels ruptured and the reactor exploded.

What was the cause of the Chernobyl Reactor Explosion?

The reactor had several design flaws which made the reactor unstable to begin with at the time of the test. The interaction of hot fuel with the cooling water led to fragmentation in the fuel along with rapid steam production causing pressure to build up.

The pressure build up caused the 1000 tons cover plate of the reactor to become detached, rupturing fuel channels and jamming the control rods. The intense steam generation spread through the entire core, which was fed by water dumped due to the rupture of the emergency cooling mechanisms. This caused a steam explosion and released fission products into the air.

A few seconds later, a second explosion blasted fragments from the fuel tower. These fragments included hot graphite which was lethal to touch.

Impact of the Chernobyl Disaster

The accident resulted in the largest radioactive release into the environment ever recorded . large quantities of radioactive dust was released into the atmosphere for 10 days, which would have adverse social and economic effects for the populations of Belarus, Ukraine and Russia.

All the xenon gas, half of iodine, caesium, 5% of remaining radioactive material was released in the incident. The released material was carried by dust and debris but the remaining lighter material was carried over by winds to Russia, Belarus and to some extent Scandinavia and rest of Western Europe

The town of Pripyat in its entirety was evacuated on 27 April. About 45,000 residents were relocated to safe-zones. By 14 May about 116,000 people who were within a 30-kilometre radius had been evacuated. A few of these returned to unofficially live within the contaminated zone with adverse effects to their health.

Following the disaster, more than 220,000 people were resettled into safe zones which had little to no contamination. The initial Chernobyl exclusion zone of 30 kms was further extended to cover 4300 square kilometres. The extension of the safe zone was to protect from the extensive radiation that had blanketed the region.

Frequently Asked Questions about Chernobyl Disaster

What caused the Chernobyl disaster?

The Chernobyl accident in 1986 was the result of a flawed reactor design that was operated with inadequately trained personnel. The resulting steam explosion and fires released at least 5% of the radioactive reactor core into the environment, with the deposition of radioactive materials in many parts of Europe.

Is Chernobyl still active?

Both the zone and the former power plant are administered by the State Agency of Ukraine on Exclusion Zone Management. The three other reactors remained operational after the accident but were eventually shut down by 2000, although the plant remains in the process of decommissioning as of 2021.

How many people died in the Chernobyl accident?

The true death toll of the Chernobyl disaster is difficult to judge because of the long-lasting health effects of radioactive pollution. The official death toll directly attributed to Chernobyl that is recognized by the international community is just **31 people** with the UN saying it could be 50.