Chernobyl, a reactor out of control-Adèle

What caused the accident?

The accident was caused by a handling error and a failure to follow instructions. Firstly, the people in charge of the situation (Anatoli Diatlov among others), disagreed on the procedures for the test operation of reactor four. Due to a lack of attention, the rods that are placed in the reactor were pushed in too far. This caused the power of the reactor to drop and the pressure to rise. The nuclear power plant has no containment room or sensor to see a malfunction, so no one was able to see the problem.

Then Anatoli Latlov, seeing that the reactor was hardly creating any energy, asked to remove the rods and restart the reactors despite the safety instructions. This made it possible to increase the power of the reactor but it was still insufficient. Anatolia still wanted to launch the test of reactor four, but a hot spot had formed in the centre of the reactor. This created a very high pressure and triggered the emergency shutdown. The emergency shutdown allows the control rods to be lowered into the core to limit the pressure, but the rods holding them were deformed by the heat. The rods could not be lowered.

The pressure, therefore, increased more and more and finally caused the cover and the whole reactor to explode.

What strategy was used to stop the effects of the disaster?

To stop the effects of the disaster, first, the fire brigade came to extinguish the fire that was next to reactor three and threatened to explode. Then, the population of the city was evacuated to limit the damage to their health (even if it was already a bit late (36 hours after the explosion). Afterwards, the aim was to stop the radioactive cloud of molten magma. Helicopters flew over the reactor and dumped bags of lead and sand to create a cover/cap. This worked, but it further increased the heat of the magma, which was in danger of breaking through the concrete slab in the basement of the plant. In its basements, there is a lot of water. The contact between the water and the magma would have created a gigantic explosion (stronger than the atomic bomb) and would have devastated the three hundred kilometres around the power station. Three men went to the heart of the power plant's basement and manually opened the drain valves so that the water could leave.

Today, a cover is placed on the plant to protect the outside from magma and radiation. A new sarcophagus is also under construction (because they need to be changed).

What are the consequences of this accident?

First of all, many people died. All those who were present at the plant or who tried to stop the effects such as firemen, scientists who were on the ground were all irradiated and died. The thirty kilometres around the plant were polluted (water, soil, plants...) and inaccessible. Most of the animals were also irradiated or killed by the liquidators. Only some survived, but sometimes with deformities...

The explosion also polluted the whole atmosphere around the site. The radiation clouds affected the neighbouring countries, Europe and the world.

What other major nuclear accidents have occurred in the world?

There have been more than 30 nuclear accidents (some of them minor) in the world.

There was the Fukushima accident in Japan in 2011 which, like Chernobyl, is ranked seven out of seven. The explosion created massive and lasting pollution. This incident caused many deaths and had serious consequences for the health of the population.

The other major nuclear accident took place in 1978 in the United States at Three Mile Island (rated five out of seven). The mechanics made the wrong decision after a cooling mechanism failed and a meltdown in the reactor core occurred. Four employees were victims as they were irradiated.

Review of the video:

I found the video very interesting and very well constructed. First of all, there was a historical point of view that put nuclear energy in context (we could see the discovery of energies by man, the discovery of radioactivity (Marie Curie...), the will to develop the industry....). We could also have a brief overview of the different energies discovered by man (mechanical energy, hydraulic energy ....).

Before explaining the accident, the report explained the functioning of a nuclear power plant (with the reactors, the control rods...) as well as the principle of the chain reaction. All this allows the viewers to understand the accident and what happened afterwards.