CHERNOBYL´S DISASTER

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1. Introduction

Chernobyl was a city located in Byelorussia, there was an explosion, caused by a nuclear reactor, more than 250.000 people died in the accident or had another effect, also the forest and the animals had effects caused by the radiation. In the accident, a lot of people died, now at days there is radiation in Chernobyl.

We will explain other nuclear accidents that happened in the world, from the less dangerous to the most dangerous. We want to explain people what is a nuclear disaster and what happened in the city of Chernobyl.

2. Objectives

- Explain what nuclear energy is.
- Show what happened in Chernobyl
- To let know about other nuclear disaster

3. What is a nuclear reactor?

A nuclear reactor is a device where a nuclear reaction is chain controlled. It can be used to obtain the energy in the so-called to produced, the production of materials fissionable, like the plutonium, although exist nuclear reactors of fusion experimental. All nuclear reactors are devices designed to maintain a chain reaction producing a steady flow of neutrons generated by the fission of heavy nuclei. They are, however, differentiated either by their purpose or by their design features. In terms of purpose, they are either research reactors or power reactors.

4. What is a nuclear reactor for?

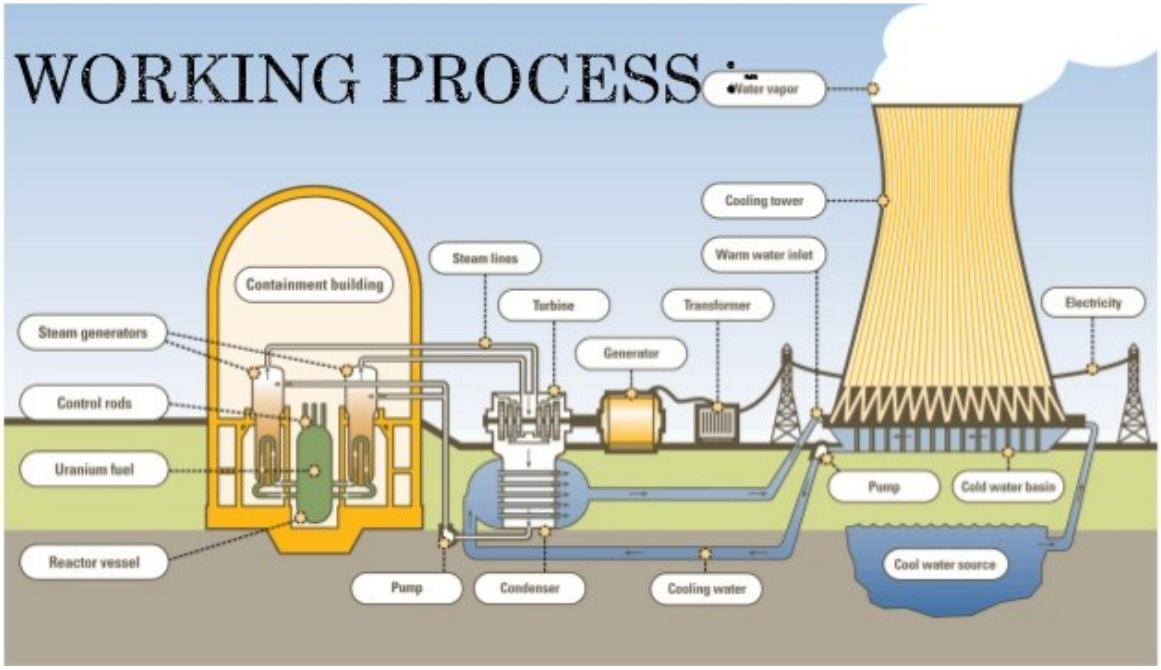
Can be used for power generation so-called nuclear power plants the production of fissile materials, such as plutonium, for use in nuclear weapons, nuclear propulsion of ships or artificial satellites or research. A nuclear power plant may have several reactors. Fission nuclear are currently only commercially produced, although there are experimental fusion nuclear reactors.

fissile material: can sustain a chain reaction with neutrons of any energy.

5. What is nuclear energy?

Nuclear energy is one that is generated by a process in which the atoms of a material called uranium disintegrate. The energy released by uranium to disintegrate its atoms produced heat that boils the water that is in nuclear reactors.

There are several disciplines and techniques that use basic nuclear energy, ranging from the generation of electrical energy in nuclear power plants to the techniques of archeological data analysis (nuclear archaeometry), nuclear medicine used in hospitals, etc.



6. What is and what happen to Chernobyl?

On April 26, 1986, the world's worst nuclear accident happened at the Chernobyl plant near Pripyat, Ukraine, in the Soviet Union. An explosion and fire in the No. 4 reactor sent radioactivity into the atmosphere.

the Chernobyl nuclear power plant in Ukraine was the product of a flawed Soviet reactor design coupled with serious mistakes made by the plant operators. It was a direct consequence of Cold War isolation and the resulting lack of any safety culture.

The Chernobyl disaster was a unique event and the only accident in the history of commercial nuclear power where radiation-related fatalities occurred. However, the design of the reactor is unique and in that respect the accident is thus of little relevance to the rest of the nuclear industry outside the then Eastern Bloc.

One person was killed immediately and a second died in hospital soon after because of injuries received. Another person is reported to have died at the time from a coronary thrombosis. Acute radiation syndrome (ARS) was originally diagnosed in 237 people on-site and involved with the clean-up and it was later confirmed in 134 cases. Of these, 28 people died because of ARS within a few weeks of the accident.

7. What happened to Chernobyl disaster?

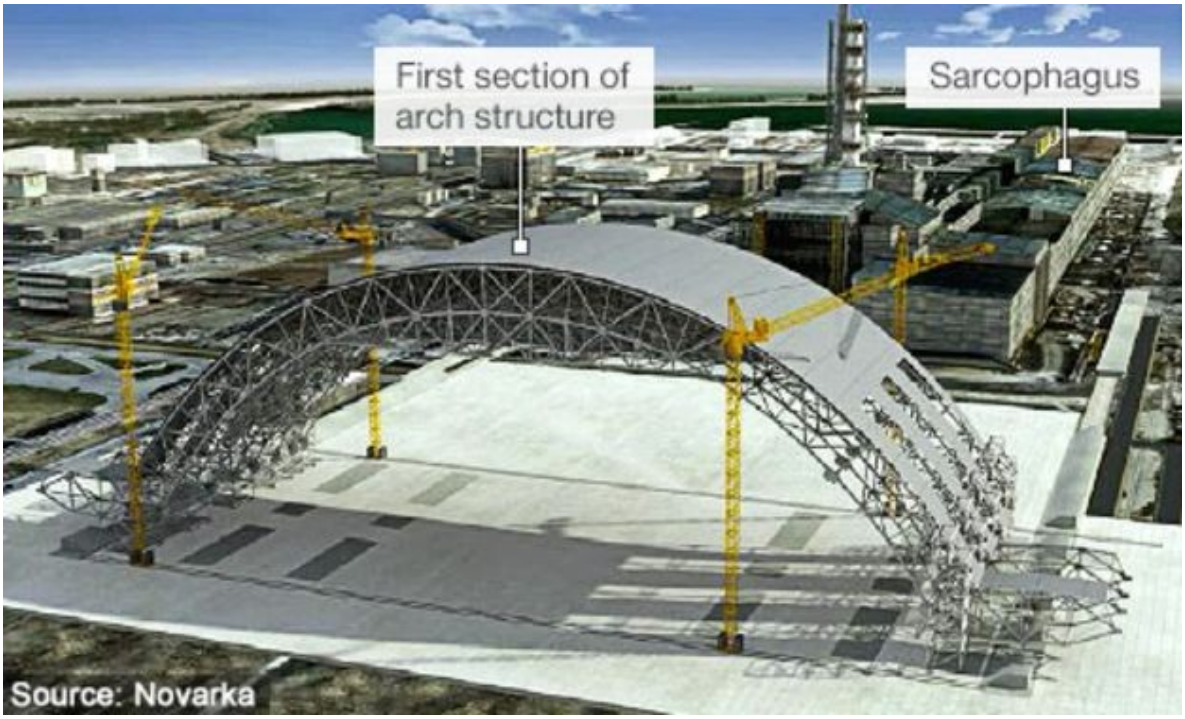
The reactor crew at Chernobyl 4 began preparing for a test to determine how long turbines would spin and supply power to the main circulating pumps following a loss of main electrical power supply. This test had been carried out at Chernobyl the previous year, but the power from the turbine ran down too rapidly, so new voltage regulator designs were to be tested.

A series of operator actions, including the disabling of automatic shutdown mechanisms, preceded the attempted test early on 26 April. By the time that the operator moved to shut down the reactor, the reactor was in an extremely unstable condition. A peculiarity of the design of the control rods caused a dramatic power surge as they were inserted into the reactor.

The interaction of very hot fuel with the cooling water led to fuel fragmentation along with rapid steam production and an increase in pressure. The design characteristics of the reactor were such that substantial damage to even three or four fuel assemblies can and did result in the destruction of the reactor. The overpressure caused the cover plate of the reactor to become partially detached, rupturing the fuel channels and jamming all the control rods, which by that time were only halfway down. Intense steam generation then spread throughout the whole core (fed by water dumped into the core due to the rupture of the emergency cooling circuit) causing a steam explosion and releasing fission products to the atmosphere. About two to three seconds later, a second explosion threw out fragments from the fuel channels and hot graphite.

8. Unit 4 containment

Chernobyl unit 4 is now enclosed in a large concrete shelter which was erected quickly (by October 1986) to allow continuing operation of the other reactors at the plant. However, the structure is neither strong nor durable. The international Shelter Implementation Plan in the 1990s involved raising money for remedial work including removal of the fuel-containing materials. Some major work on the shelter was carried out in 1998 and 1999. About 200 tons of highly radioactive material remains deep within it, and this poses an environmental hazard until it is better contained.



9. Accidents around the world

Goiania Accident, Brazil 1987 – Level 5

On 13th September 1987, a radioactive contamination accident occurred in the Brazilian state of Goais. An old radiotherapy source was stolen from an abandoned hospital site in the city. Subsequently it was handled by many people, killing four people. 112,000 people were examined for radioactive contaminations with 249 having significant levels of radioactive material in or on their body.

Three Mile Island Accident, Pennsylvania USA 1979 – Level 5

28th March saw two nuclear reactors meltdown. It was subsequently the worst disaster in commercial nuclear power plant history. Small amounts of radioactive gases and radioactive iodine were released into the environment. Luckily, epidemiology studies have not linked a single cancer with the accident.

Windscale Fire (Sellafield), UK 1957 – Level 5

The worst nuclear disaster in Great Britain's history occurred on the 10th October, 1957 and ranked at level 5 on the INES scale, The Windscale Fire. The two piles had been hurriedly built as part of the British atomic bomb project. The first pile was active from October 1950 with the second close behind in June 1951. The accident occurred when the core of Unit 1's reactor caught fire, releasing substantial amounts of radioactive contamination into the surrounding area. 240

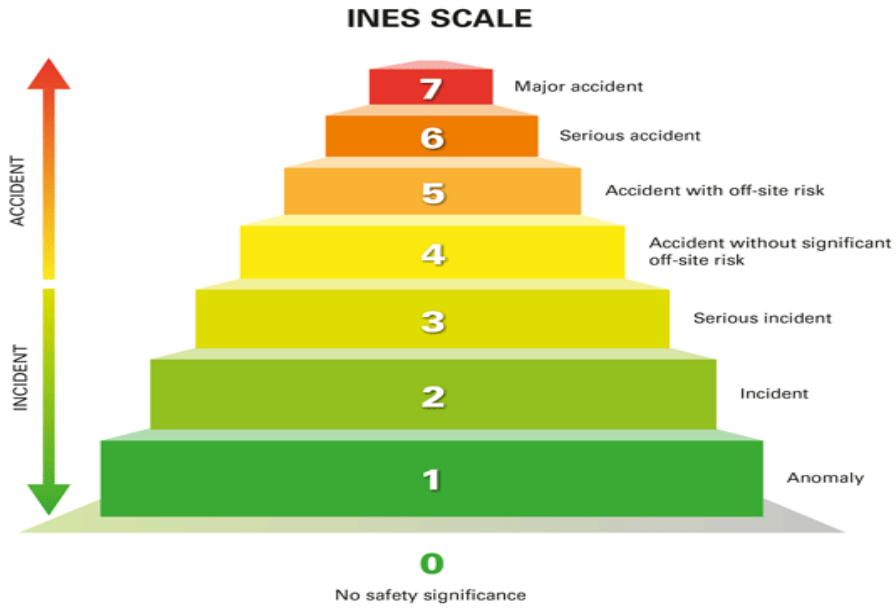
cancer cases have since been linked to the fire. All the milk from within about 500km of nearby countryside was diluted and destroyed for about a month.

Kyshtym, Russia 1957 – Level 6

The Kyshtym Nuclear disaster was a radiation contamination incident that occurred on 29 September 1957 at Mayak, a Nuclear fuel reprocessing plant in the Soviet Union. It measured as a Level 6 disaster on the INES, making it the third most serious nuclear disaster ever recorded behind the Chernobyl Disaster and Fukushima Daiichi Disaster. The event occurred in the town of Ozyorsk, a closed city built around the Mayak plant. Since Ozyorsk/Mayak was not marked on maps, the disaster was named after Kyshtym, the nearest known town.

Fukushima, Japan 2011 – Level 7

The Fukushima Daiichi nuclear disaster was a series of equipment failures, nuclear meltdowns and releases of radioactive materials at the Fukushima, Nuclear Power Plant, following the Tohoku Tsunami on 11 March 2011. It is the largest nuclear disaster since the Chernobyl disaster of 1986 and only the second disaster (along with Chernobyl) to measure Level 7 on the INES.



10. Explanation of Ines scale

The scale goes between 1 to 7 types of disaster, levels 1 through 3 are called “incidents”, (an incident is an event that is either unpleasant or un usual, that lead to serious consequences) these types are not that dangerous even thou they cause damage.

Levels 4 through 7 are were the disaster becomes an “accident”, (an accident is an undesirable, incidental, and unplanned event that could have been prevented)

and cause several damages not only in edifications but also to people.