**NUCLEAR DISAATER : causes and consequences**

Radioactive substances are resent in nature. They undergo radioactive decay in which unstable isotopes spontaneously gives out fast moving particles, high energy radiations or both.

Cosmic rays from outer space, radioactive radon-222, soil, rocks, air, water and food which contain one or more radioactive substance are the natural sources of radioactivity. On the other hand, nuclear power plants, nuclear accidents, x-ray, test laboratories etc. where radioactive substances are used, are anthropogenic sources of radioactivity.

Nuclear disaster can occur at any stage of the nuclear fuel cycle. However the possibility of reactor accidents is considered as more seriously because the effects of reactor accidents are more drastic.

Many estimates of hypothetical accidents in a nuclear power station are made. But collapse of any estimated device results in nuclear accidents like release of radioactive debris which can affects a substantial portion of human population. In order to realize the nuclear accident, we can cite **Chernobyl Nuclear Disaster** as for example to realize the probable drastic situation**.**

The **Chernobyl disaster** was a [nuclear accident](https://en.wikipedia.org/wiki/Nuclear_accident) that occurred on 26 April 1986 at the No. 4 reactor Chernobyl Nuclear Power Plant Pripyat Ukrainian SSR Soviet Union.The reactor had been contionously working for two years. It was shut down on April 25, 1986 for intermediate repairs. The period coincided with the period when people including the top executives were busy in the preparations for national holiday, The May Day. Due to faulty operations of shutting down the plant, an explosion occurred in the reactor at 01.23 hrs on april.1986. Three seconds later another explosion occurred.

The explosion was so severe that the 1000 tonnes steel concrete of reactor 4 blew off. Fire started at the reactor due to combustion of graphic rods.. The reactor temperature soared to more than 2000 C. Fuel and radioactive debris spewed out in a volcanic cloud of molten mass of the core and gases. The debris and gases drifted over most of the northern hemisphere. Poland,Denmark, Sweden and Norway were affected.

On first day of the accident 31 persons died and 239 people were hospitalized .An increase in thyroid cancer in children from areas near Chernobyl was registered. More than 2000 people died. People suffered from unclearing skin, loss of hair and anemia.

Agricultural produce was damaged for years. Intense radiation destroyed several fields, trees, shrubs, plants.etc.

A **nuclear explosion** is an [explosion](https://en.wikipedia.org/wiki/Explosion) that occurs as a result of the rapid release of energy from a high-speed [nuclear reaction](https://en.wikipedia.org/wiki/Nuclear_reaction)..

Atmospheric nuclear explosions are associated with [mushroom clouds](https://en.wikipedia.org/wiki/Mushroom_cloud), although mushroom clouds can occur with large chemical explosions. It is possible to have an air-burst nuclear explosion without those clouds. Nuclear explosions produce radiation and radioactive debris that is harmful to humans and can cause moderate to severe skin burns, eye damage, [radiation sickness](https://en.wikipedia.org/wiki/Radiation_sickness), [radiation-induced cancer](https://en.wikipedia.org/wiki/Radiation-induced_cancer) and possible death depending on how far from the blast radius a person is.[[1]](https://en.wikipedia.org/wiki/Nuclear_explosion#cite_note-1) Nuclear explosions can also have detrimental effects on the climate, lasting from months to years. In 1983 [Carl Sagan](https://en.wikipedia.org/wiki/Carl_Sagan) in one of his article claimed that a small-scale nuclear war could release enough particles into the atmosphere to cause the planet to cool and cause crops, animals, and agriculture to disappear across the globe—an effect named [nuclear winter](https://en.wikipedia.org/wiki/Nuclear_winter).

**Nuclear Winter**

Another potential devastating effect of nuclear war is termed [nuclear winter](https://en.wikipedia.org/wiki/Nuclear_winter). Nuclear explosions eject small particles from the Earth's surface into the atmosphere. Once these harmful particles are lofted, strong upper level winds in the troposphere can transport them thousands of kilometers and can end up transporting nuclear fallout and also alter the Earth's radiation budget. Once enough small particles are in the atmosphere, they can act as cloud condensation nuclei which will cause global cloud coverage which in turn blocks incoming solar insolation and starts a global cooling period. Flash blindness is caused by the initial brilliant flash of light produced by the nuclear explosion. More light energy is received on the retina than can be tolerated, but less than is required for irreversible injury. The retina is particularity susceptible to visible and short wavelength infrared light, since this part of the electromagnetic spectrum is focused by the lens on the retina. The result is bleaching of the visual pigments and temporary blindness for up to 40 minutes.

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