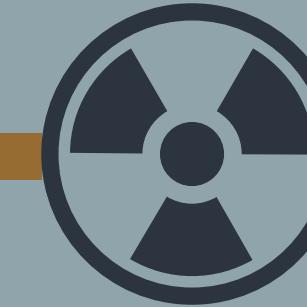


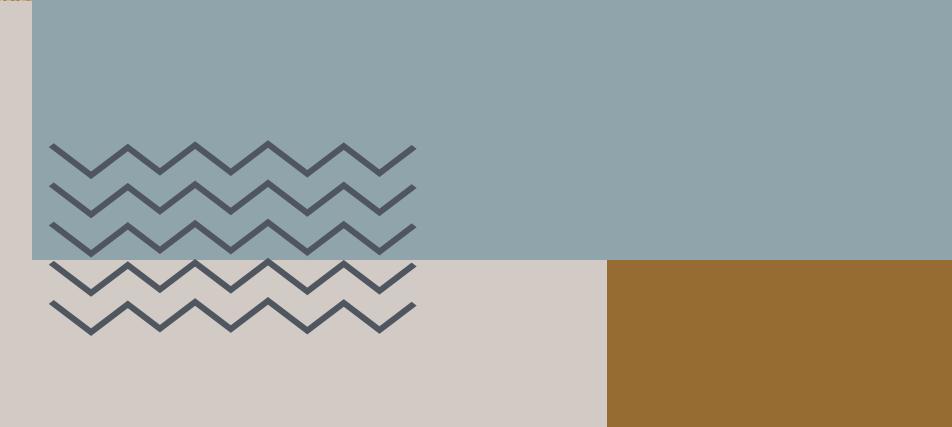
NUCLEAR POLLUTION

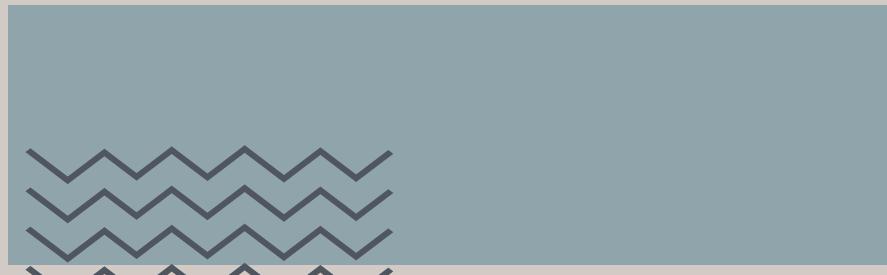


THE DOUBLE-EDGED SWORD
OF NUCLEAR PROGRESS

PRESENTED BY : TEAM 4

Made By:
Harshwardhan, Kalpana, Jatin
Karan, Himanshu, Jitesh





THE POWER OF NUCLEAR ENERGY

Nuclear Energy is produced by splitting the atomic nuclei of an unstable heavy atom. During this process immense amount of energy is produced in the form of heat, which can then be used to produce electricity.

It is generally low-carbon and very efficient energy source but in return hazardous radioactive material which possesses great risk to human life at the time of mishandling and accidents.

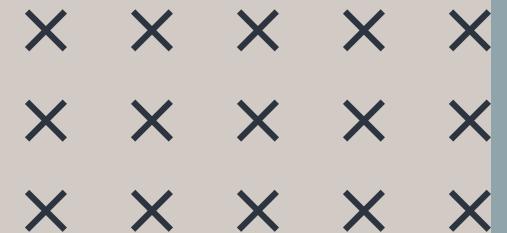
What are these High Energy rays or particals?

High energy particles like Alpha rays, Beta rays, and Gamma radiation are some examples.

What's wrong with NUCLEAR Power?

Unlike generic pollutants in the environment which could be chemically neutralized or biologically degraded, the radioactive materials cannot be destroyed or treated through normal processes. The only way to neutralize them is to leave them alone for thousands and thousands of years, depending upon material's half-life.

BENEFITS OF NUCLEAR ENERGY



Nuclear energy is a potential solution to address the growing global energy demand. With its ability to generate electricity on a large and stable scale, this energy source is considered a strategic option to support sustainable development. Unlike polluting fossil fuels, nuclear energy offers a clean energy source with very low carbon emissions. Furthermore, modern nuclear technology is continuously being developed to improve its efficiency and operational safety.

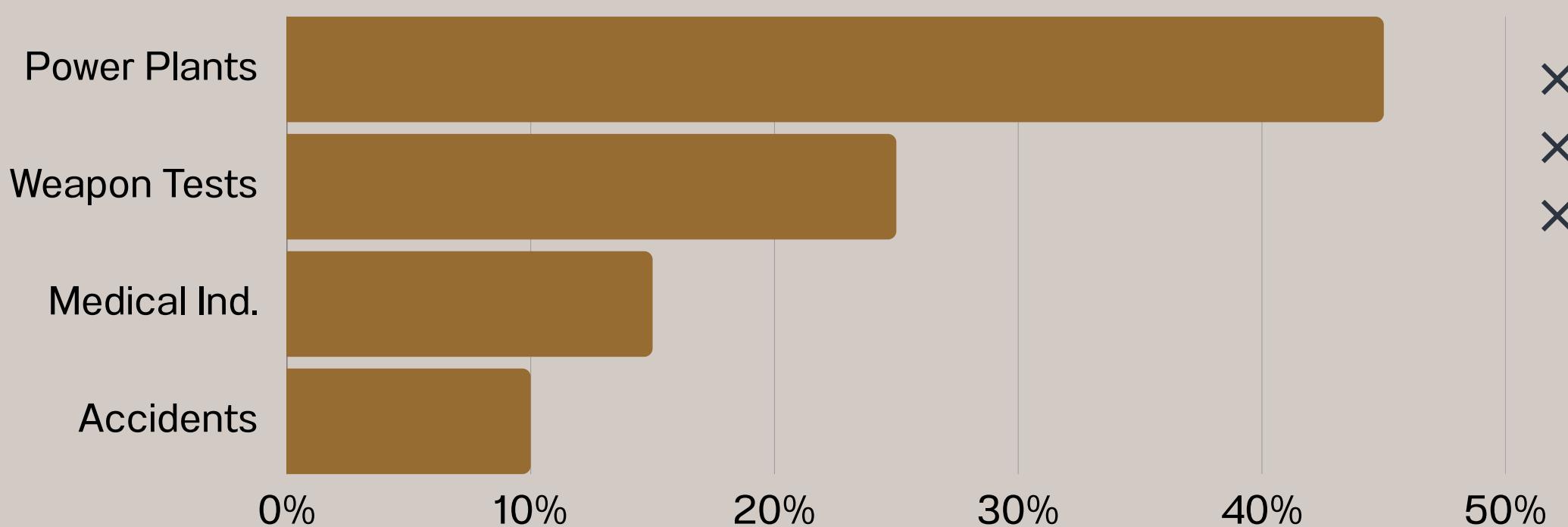


► **Low Carbon Emissions**

► **Stable & Large-Scale Energy Production**

► **Reducing Dependence on Fossil Fuels**

MAJOR SOURCES OF NUCLEAR POLLUTION



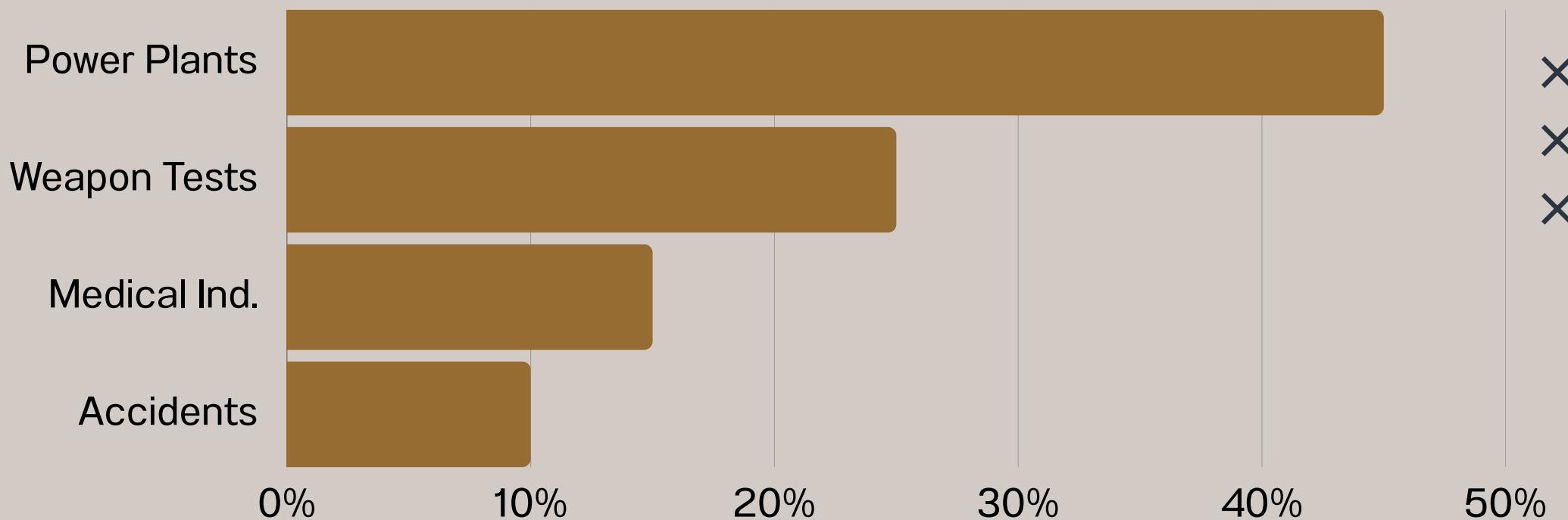
Nuclear Power Plants

During various operations in a nuclear facility, some amount of radioactive waste is generally leaked in the form of dust or liquid in the environment.

More severe conditions could be Equipment Failures, Accidents and Human Errors.



MAJOR SOURCES OF NUCLEAR POLLUTION



Nuclear Weapon Testing

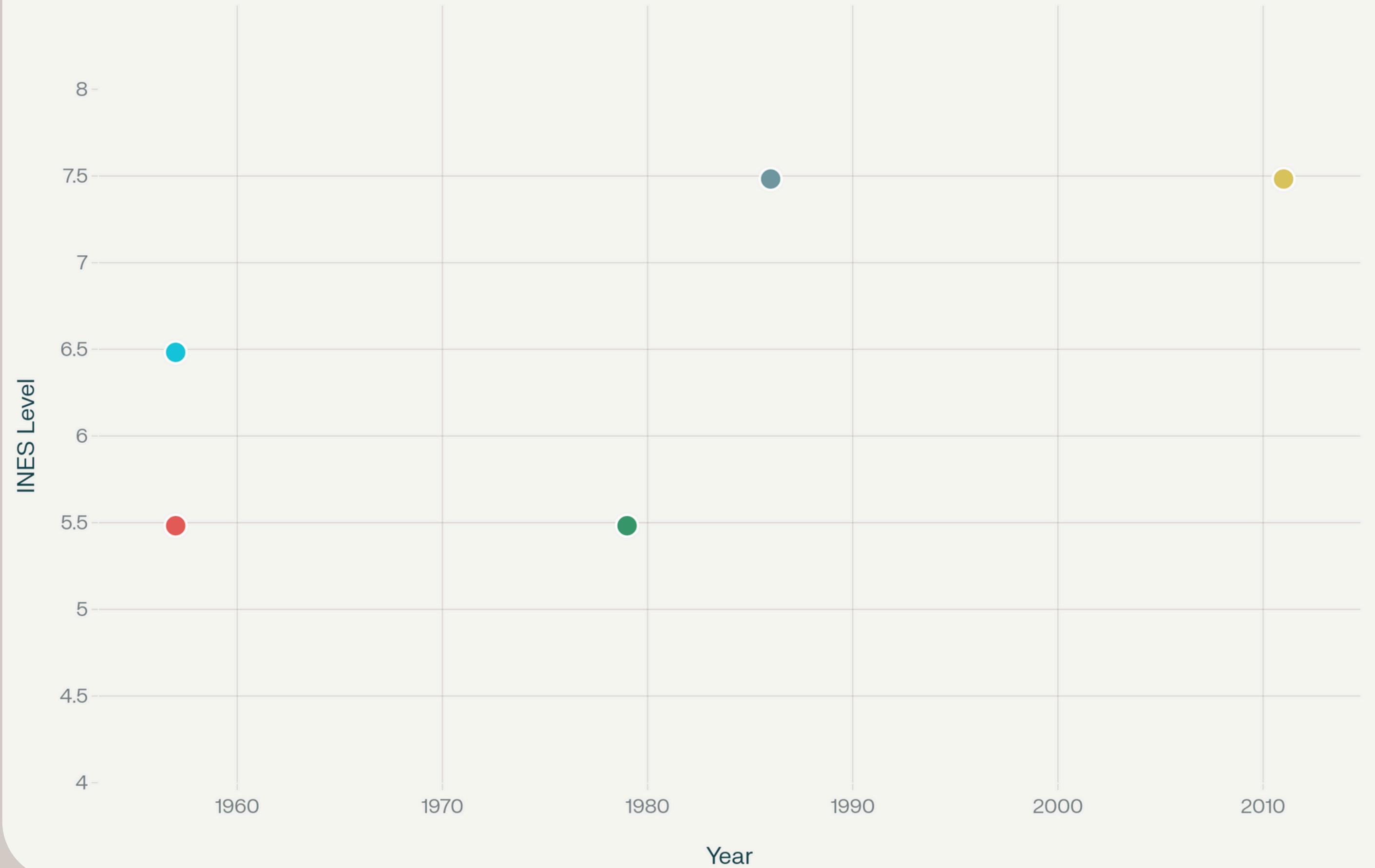
Historically production and testing of nuclear weapons has contributed greatly in global radioactive contamination. Between 1940s and 1990s, over 2,000 nuclear weapons tests were conducted worldwide.

The maintenance of these warheads also poses a risk of accident and contamination.

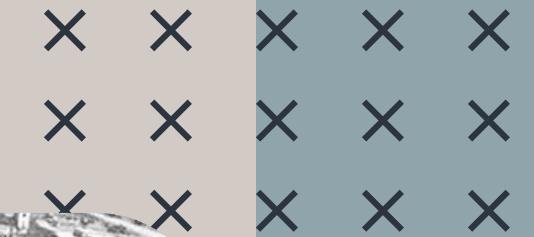


Event ● Kyshtym ● Windscale ● Three Mile Isld ● Chernobyl ● Fukushima

Major Nuclear Disaster Timeline



MAJOR NUCLEAR DISASTERS AND THEIR IMPACTS

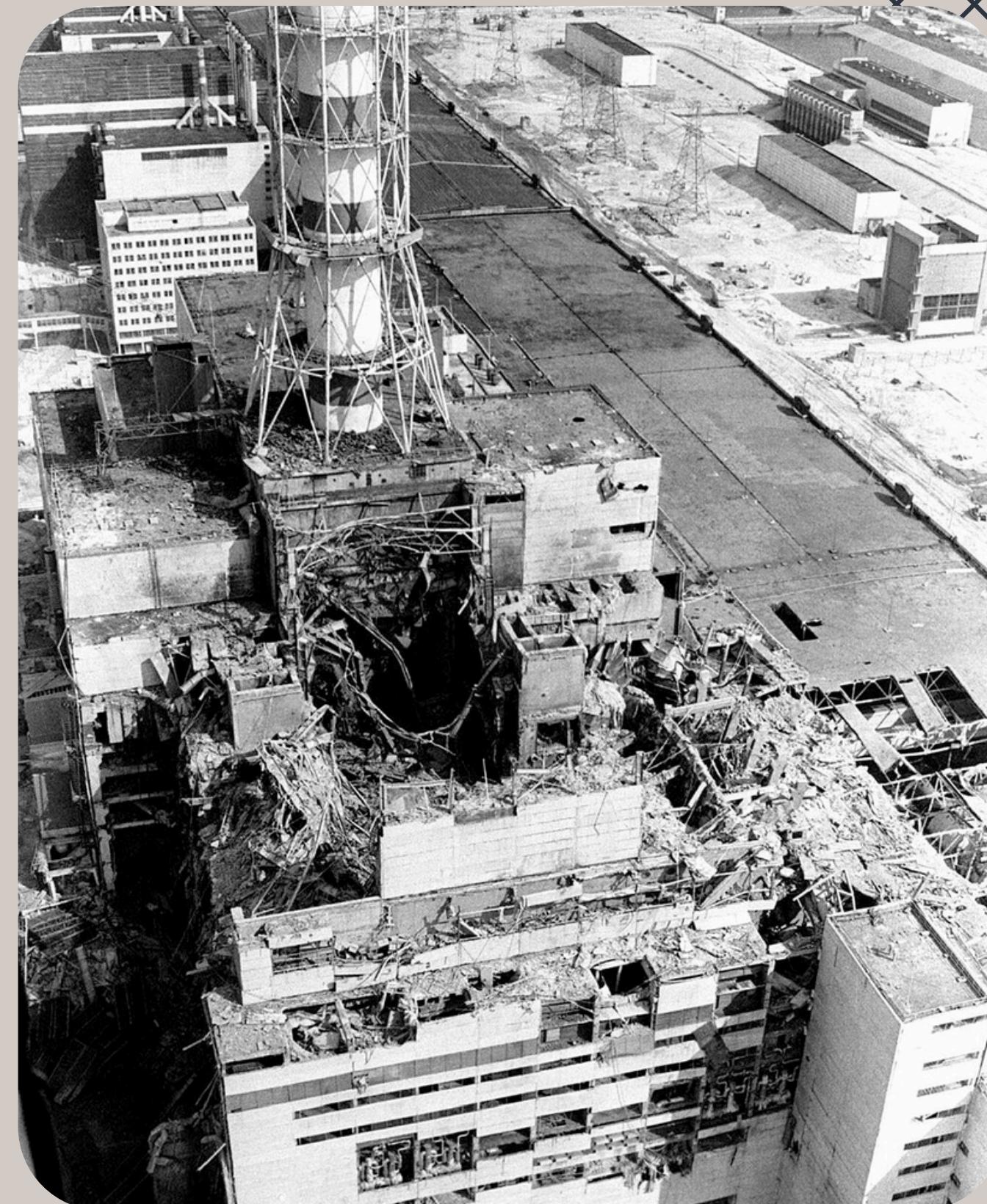


Chernobyl Disaster (1986)

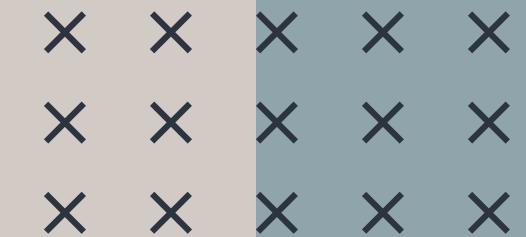
Rated Level 7 on the International Nuclear Event Scale, Chernobyl is the most severe Nuclear disaster in the history.

The explosion and fire at reactor 4, it contaminated area over 200,000 sq.km

- 30 people died within a week
- 28 people dies within a span of 3 months
- More than 300,000 were relocated
- Over 6,000 cases of childhood thyroid cancer attributed to the disaster.
- Projected 9,000-10,000 excess cancer deaths over the lifetime of exposed populations.



MAJOR NUCLEAR DISASTERS AND THEIR IMPACTS



Fukushima Daiichi Accident (2011)

The Fukushima disaster, triggered by a magnitude 9.0 earthquake and subsequent tsunami, became the second Level 7 nuclear accident, causing 3 nuclear reactor safety system to meltdown.

- People within a area of 30km were completely evacuated.
- Nearly 156,000 were displaced from there homes.

The accident demonstrated that even modern nuclear plants with advanced safety systems remain vulnerable to extreme natural events





NUCLEAR WASTE MANAGEMENT

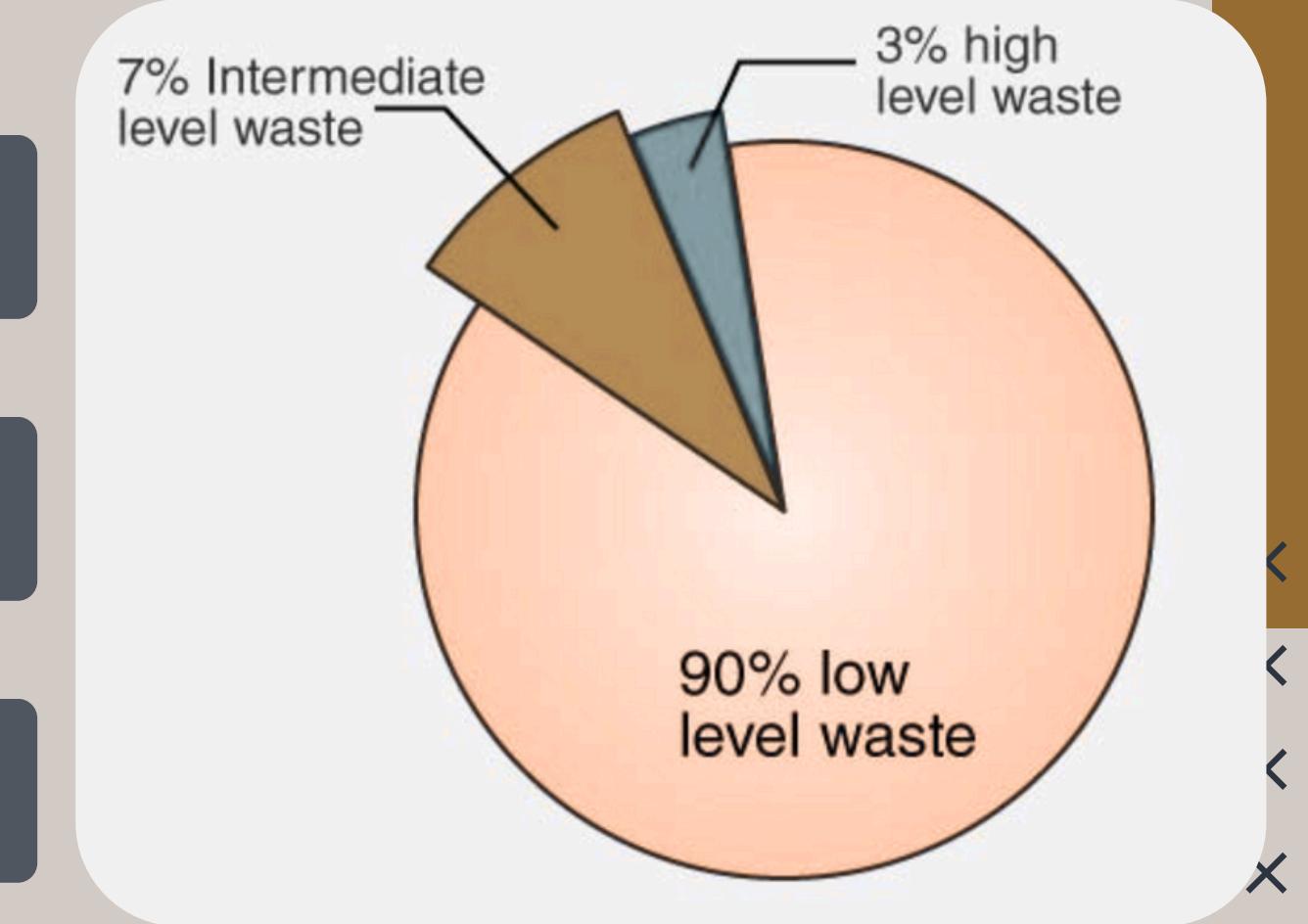
Nuclear waste management represents one of the most challenging aspects of nuclear technology, requiring solutions that remain effective for thousands of years

Types of Nuclear Waste

► High-Level Waste (HLW).

► Intermediate-Level Waste

► Low-Level Waste



DISPOSAL METHODS

DEEP GEOLOGICAL DISPOSAL

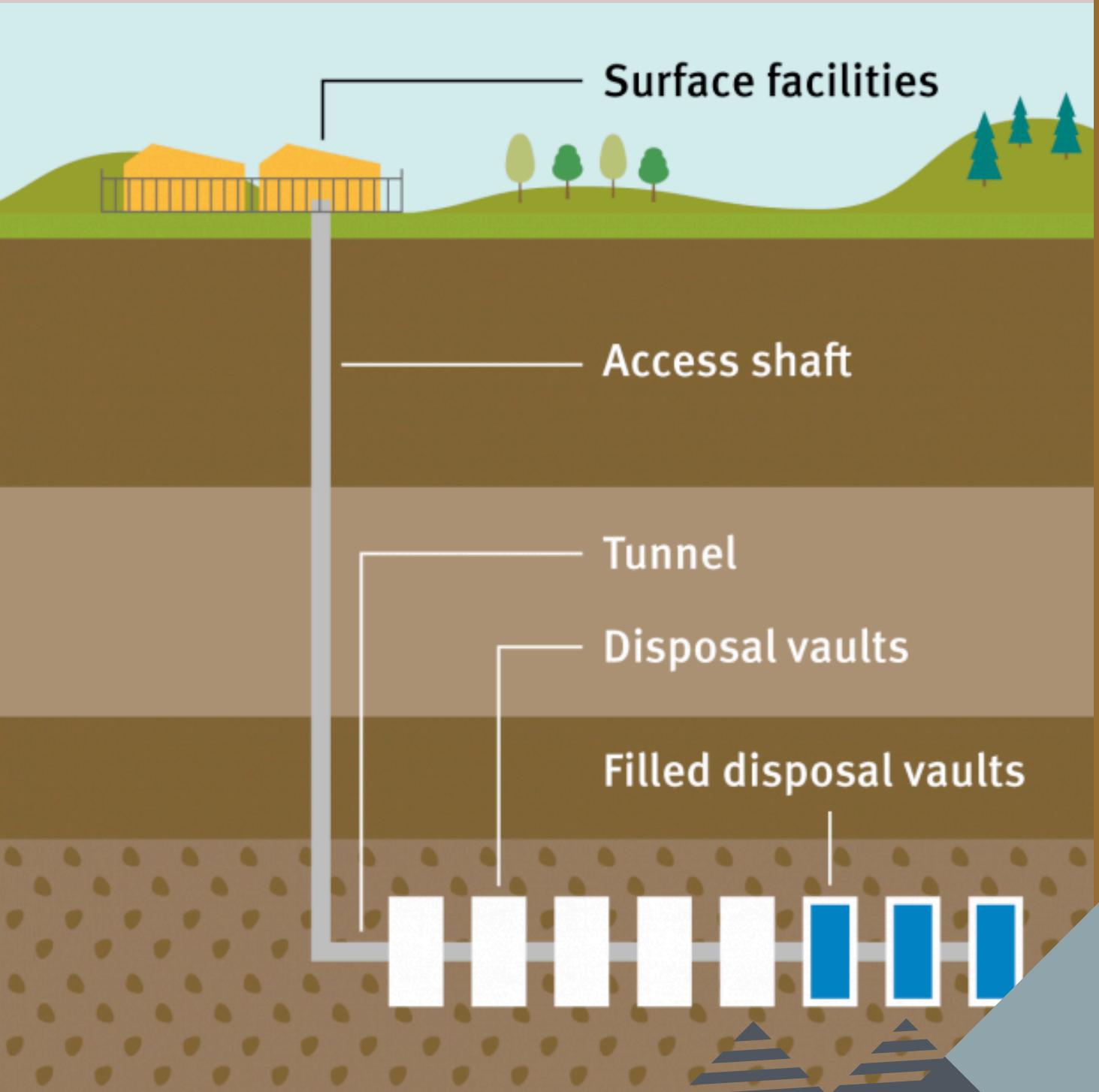
The international consensus for managing high-level nuclear waste, have guidelines to bury the radioactive waste in deep underground repositories. These are made at stable geological locations at 300-1000 meters deep.

These are some advantages:

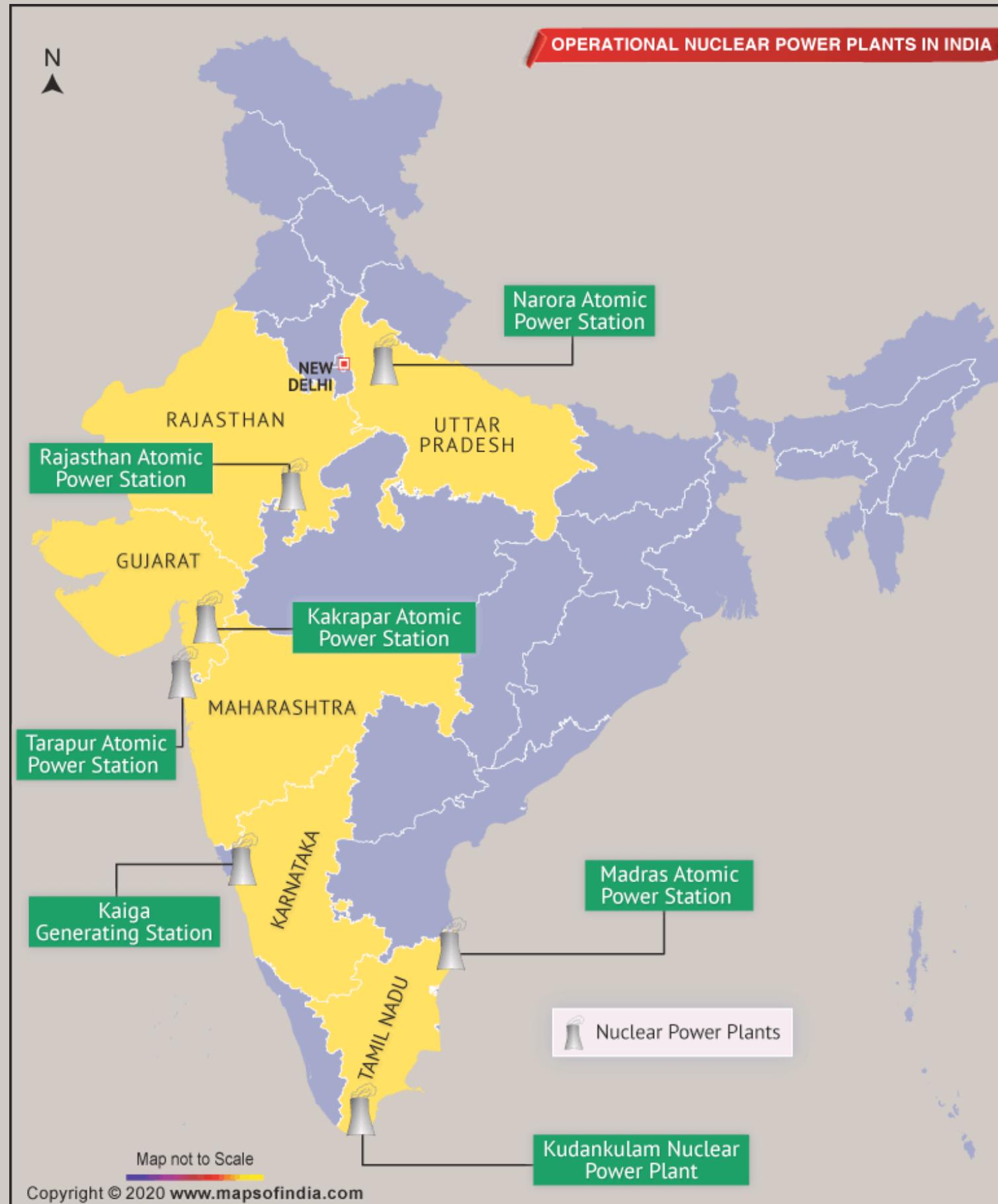
- Multiple natural and engineered barriers prevent radioactive release
- Isolation from human contact and environmental systems
- Long-term stability in suitable geological conditions

New Techniques are emerging with advancement in nuclear science to manage nuclear waste but Deep Disposal still remains the most effective one.

x x x x x
x x x x x



KUDANKULAM NUCLEAR POWER PLANT (TAMIL NADU)



Total capacity (existing + upcoming): 6000 MW

TARAPUR ATOMIC POWER STATION (MAHARASHTRA)



India's first commercial nuclear power plant (1969)



**THANK YOU
EVERYONE!!**

× × × × ×
× × × × ×
× × × × ×



