

# 1986 CHERNOBYL DISASTER

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# DISASTER OVERVIEW

- **The Chernobyl disaster occurred on April 25 and 26, 1986, at the Chernobyl nuclear power station in the Soviet Union. It is one of the worst disasters in the history of nuclear power generation.**
- **The Chernobyl power station was situated at the settlement of Pryp'yat, 16 km northwest of the city of Chernobyl.**

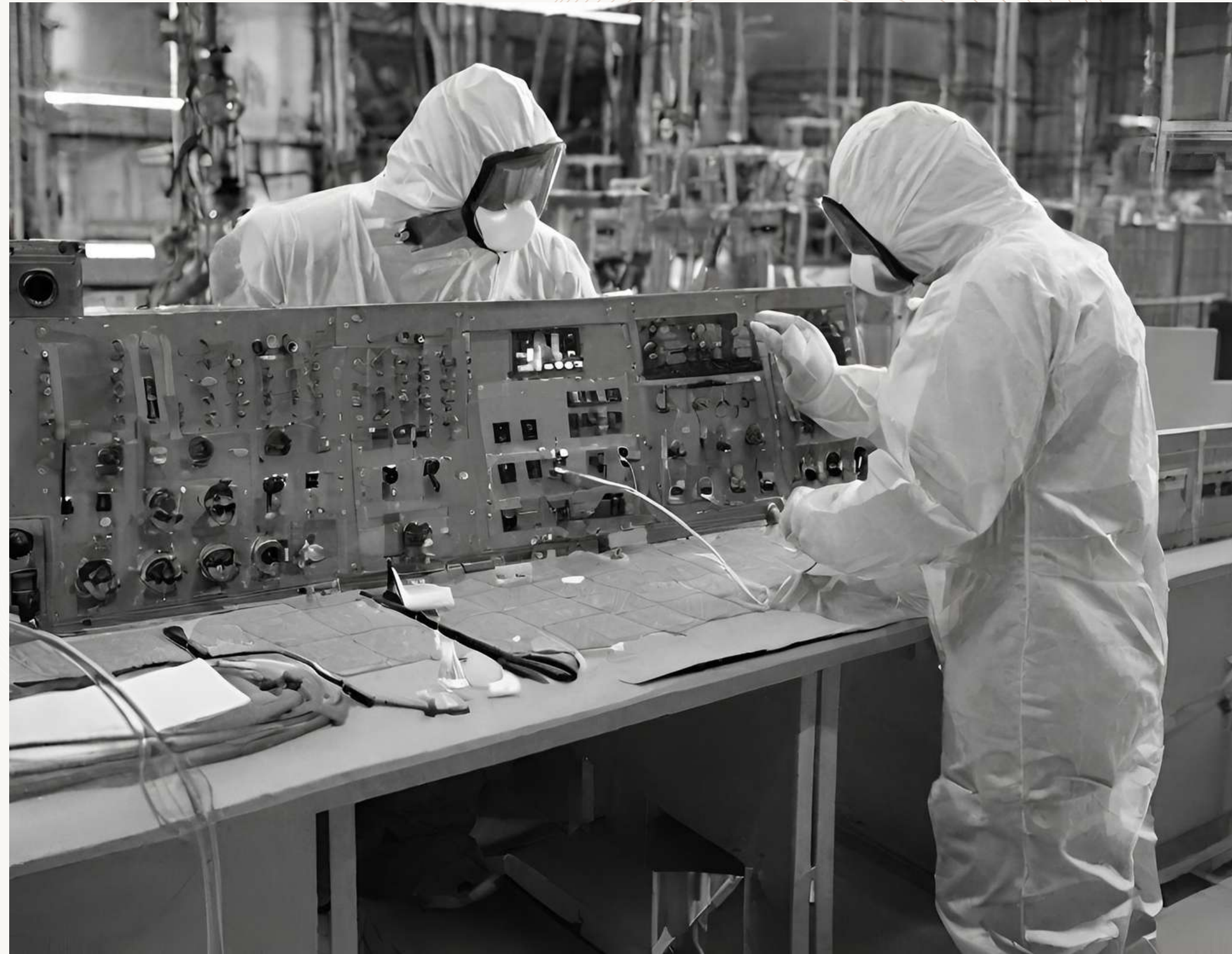


# DISASTER OVERVIEW

- Technicians **shut down** the reactor's power-regulating system and its emergency safety systems.



- They **allowed** the reactor to run at 7% power.



# DISASTER OVERVIEW



- **Uncontrolled chain reaction**

+

- **Several massive explosions**

# DISASTER OVERVIEW

- **As a result of the initial explosion **two workers died immediately.****



- ****Twenty-eight** of the firemen and emergency clean-up workers died within a few weeks due to **Radiation Sickness.****

# DISASTER OVERVIEW

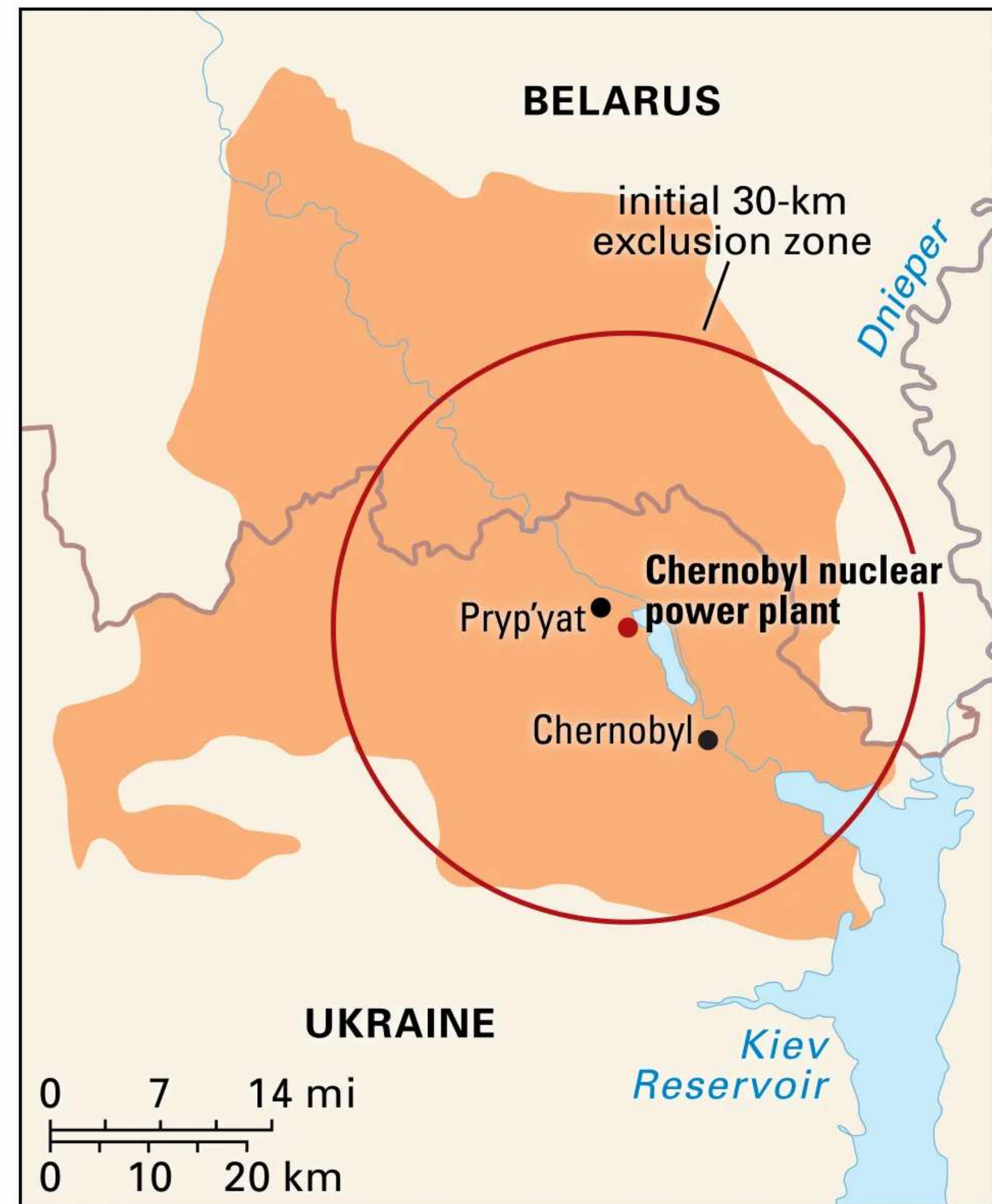


- The entire town of Pripyat (population **49,360**) was completely evacuated 36 hours after the accident.
- In total, some **200,0000** people are believed to have been relocated.

# CHERNOBYL NUCLEAR ACCIDENT OF 1986

 Present-day  
exclusion zone  
(2016)

The initial circular exclusion zone in 1986, which had a radius of 30 km (18.6 mi), was later replaced by one with an irregular shape that spanned 4,143 sq km (1,600 sq mi) and was designed to enclose additional contaminated areas.





# DISASTER OVERVIEW

- On April 28, Swedish monitoring stations reported **abnormally high levels of wind-transported radioactivity.**



- The Soviet government admitted

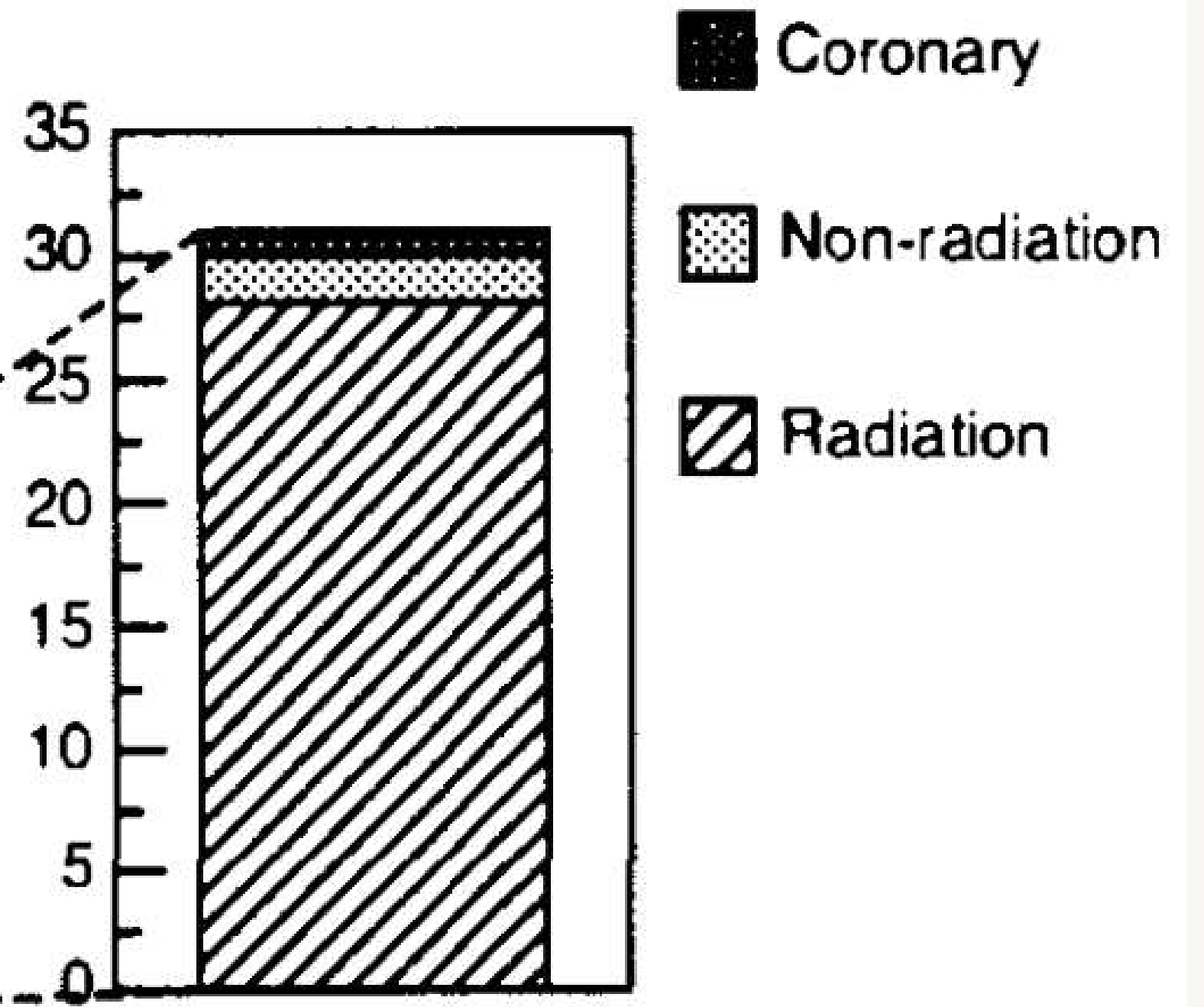
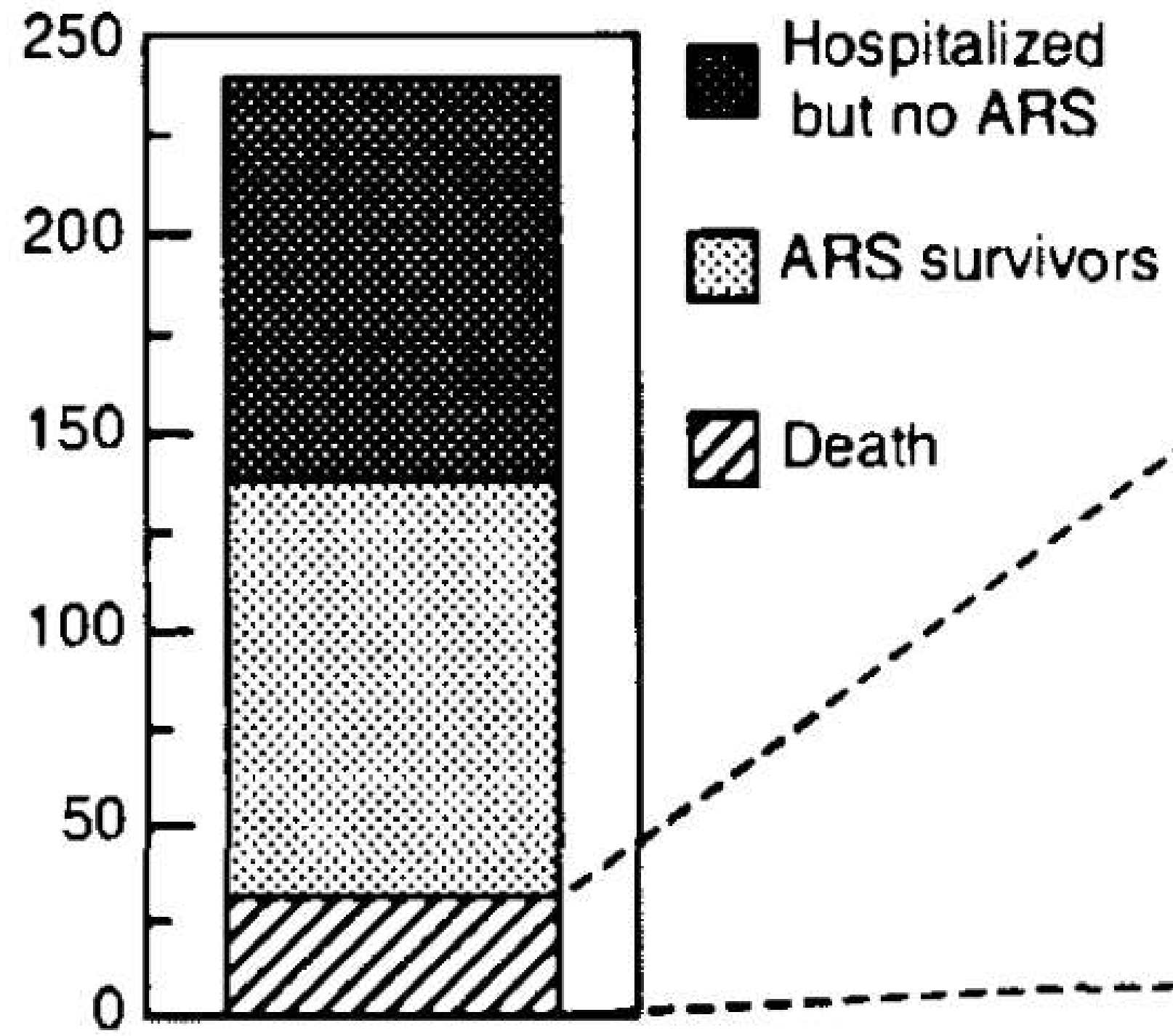
**“A NUCLEAR ACCIDENT ANYWHERE IS A NUCLEAR ACCIDENT EVERYWHERE”**

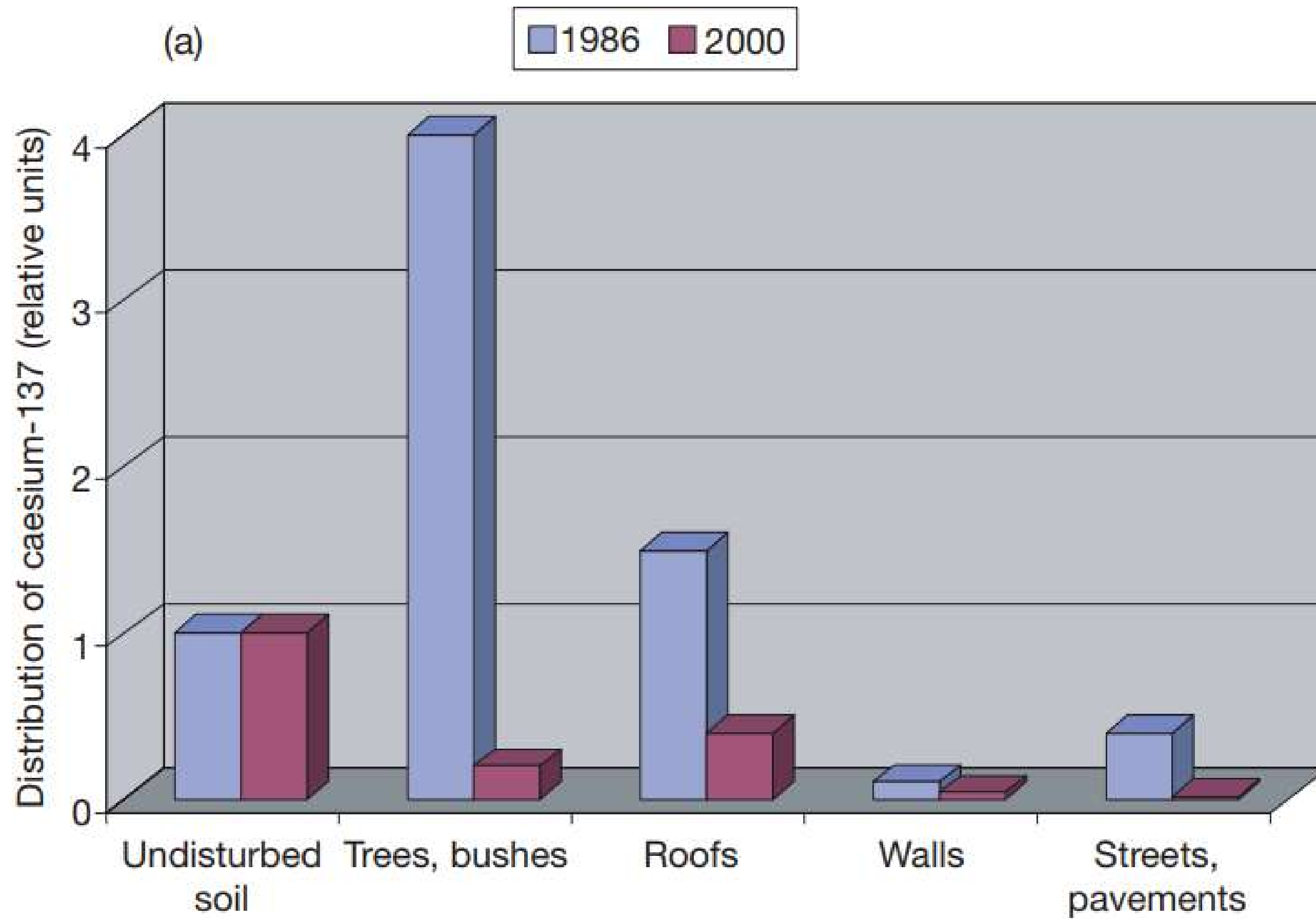
# DISASTER OVERVIEW

- By May 4, they managed to **control the heat and radioactivity** leaking from the reactor.



- **Buried radioactive debris in about 800 places temporarily.**
- **Later that year, they covered the highly radioactive reactor core with a concrete-and-steel structure.**



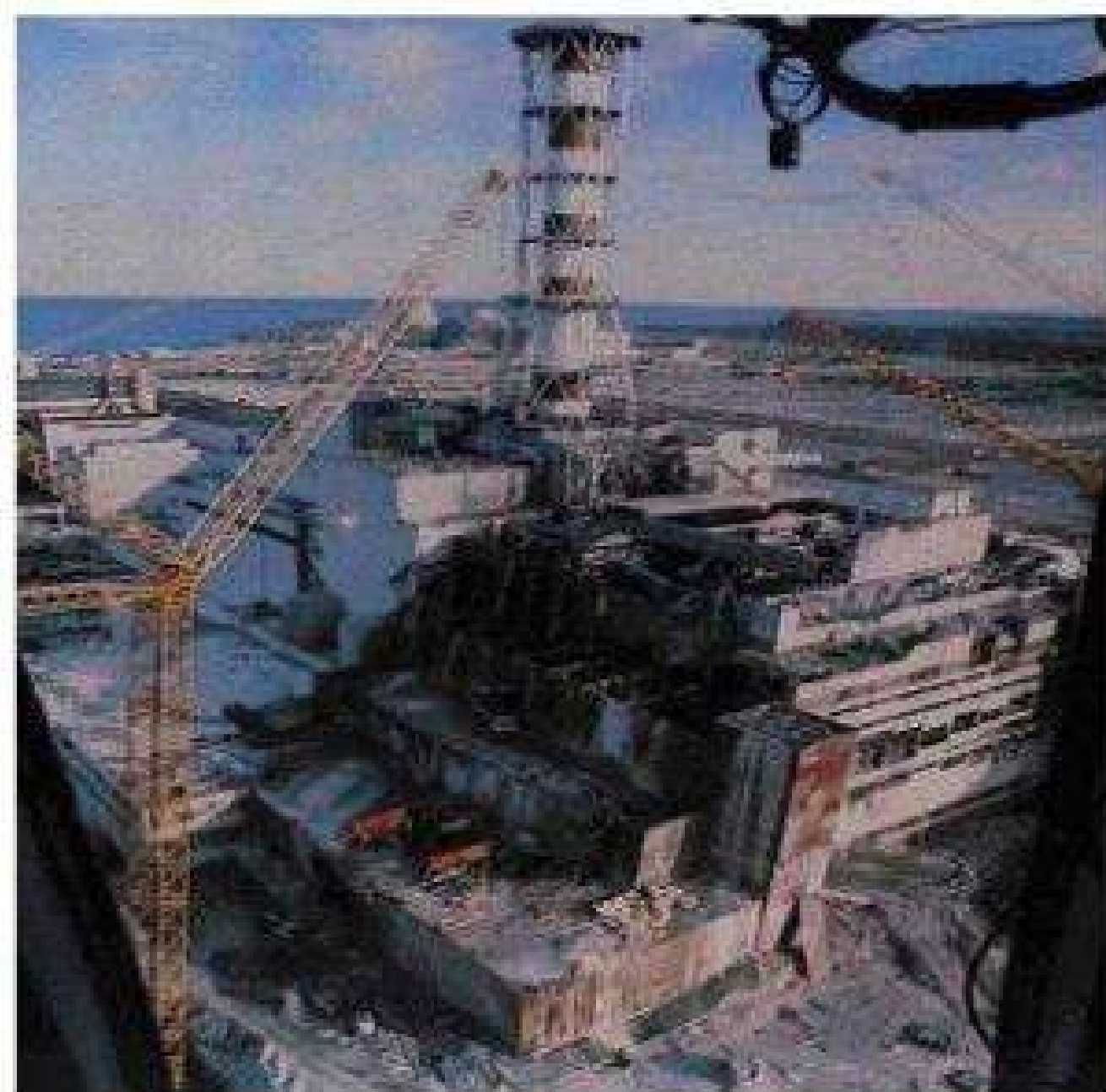


# PRECAUTIONS

Before



After



# DISASTER MANAGEMENT

## SELF RESPONSE OF THE SOVIET UNION

- **Downplayed** the severity of the incident, kept the accident as a secret.



- **Delayed** reporting it to the international community.

# DISASTER MANAGEMENT

## SOVIET AUTHORITIES



- **Emergency crews** used helicopters to pour sand and boron on the reactor debris.



- The nearby town of Pripyat and surrounding areas were **evacuated**.

# DISASTER MANAGEMENT

## SOVIET AUTHORITIES

- The Soviet government cut down a square mile of pine forest near the plant to **prevent further release of fire**.



- Specialized medical programs were established to provide **healthcare** for individuals affected by radiation exposure (thyroid cancer).



# DISASTER MANAGEMENT

## GLOBAL RESPONSES TO THE DISASTER

- Western European countries detected **increased radiation levels** and pressured the Soviet Union for information.
- Some countries implemented measures like **banning the consumption of certain food products** due to contamination.



# DISASTER MANAGEMENT

## GLOBAL RESPONSES TO THE DISASTER

- The U.S. helped in building a **protective shelter** or **sarcophagus** to cover the destroyed reactor to prevent further contamination (temporary).

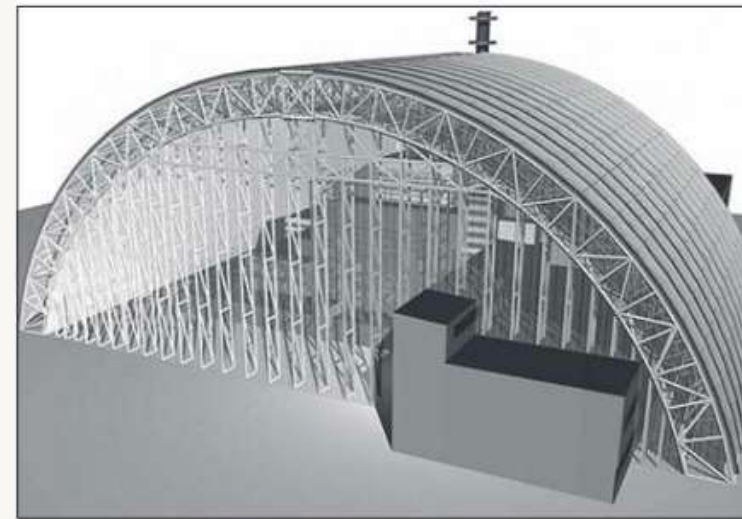


- **The Chernobyl Shelter Fund**, managed by the European Bank for Reconstruction and Development (EBRD), was established to finance the construction of the **New Safe Confinement (NSC)**.

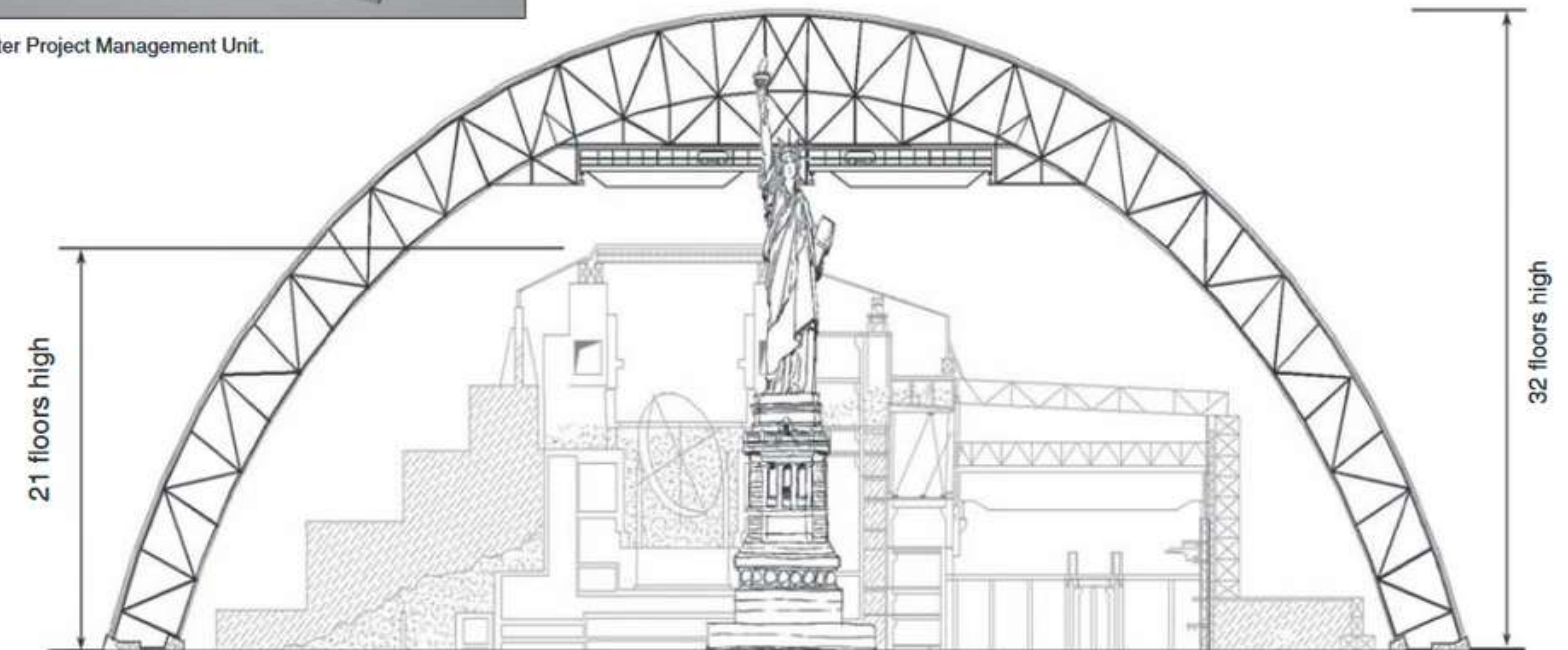
# DISASTER MANAGEMENT

## GLOBAL RESPONSES TO THE DISASTER

- **“New Shelter”** was built in 2016 at 32,000 tons and \$2.3 billion—and intended to stand for at least a century.
- **The NSC** is a massive structure designed to encase the damaged reactor and prevent further releases of radioactive material.



Source: Chernobyl Shelter Project Management Unit.



# DISASTER MANAGEMENT

## GLOBAL RESPONSES TO THE DISASTER



- **The IAEA (International Atomic Energy Agency)** played a role in coordinating international efforts and facilitating information exchange among countries.



- **The Group of Seven (G7) and the European Community** were involved in providing financial and technical assistance to Ukraine and other affected countries.

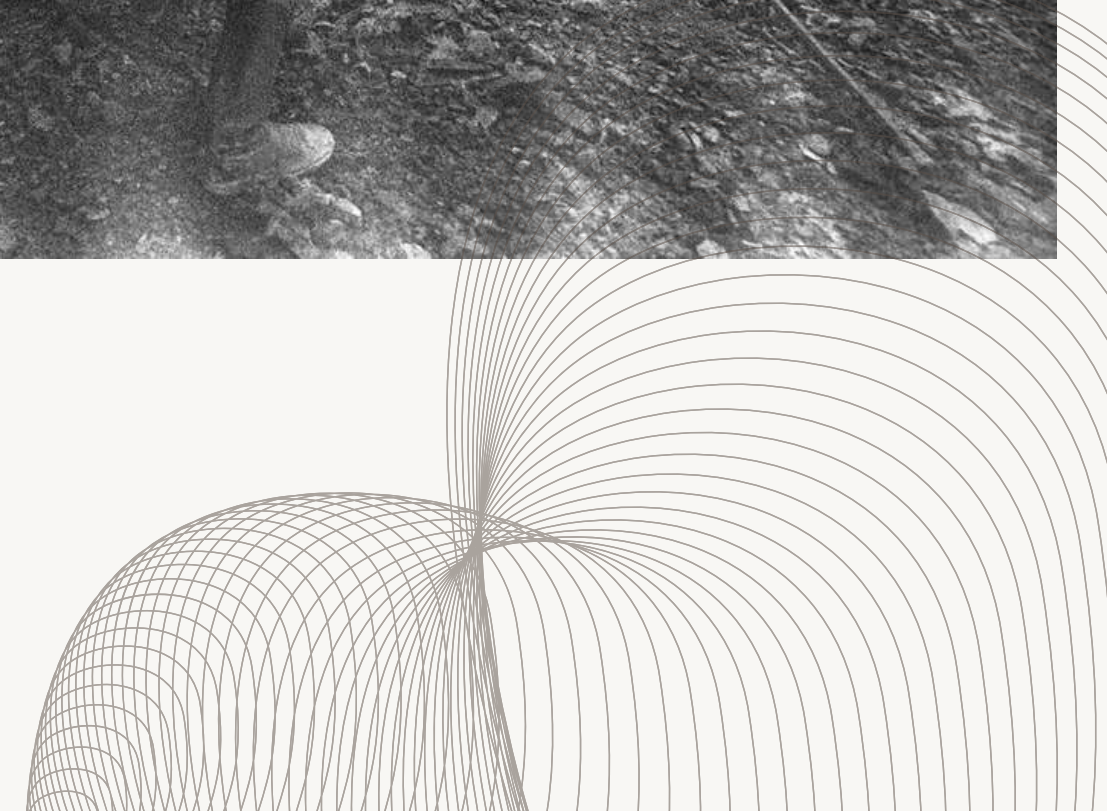
# SPECIFIC ACTIONS

- **CONTAINMENT**

Emergency workers, often referred to as "**liquidators**," took measures to contain the spread of radioactive materials. This included efforts to extinguish the fires and prevent the release of further radioactive particles into the atmosphere.

- **MASS EVACUATION**

Government evacuated about **115,000** people from the most heavily contaminated areas in 1986, and another **220,000** people in subsequent years.



# SPECIFIC ACTIONS

- **CONCRETE SARCOPHAGUS**

To contain the radioactive material and prevent further release, a massive concrete structure called the "**sarcophagus**" was constructed over the destroyed reactor. This structure was completed in November 1986 and later replaced by the **New Safe Confinement** (NSC) in 2016.

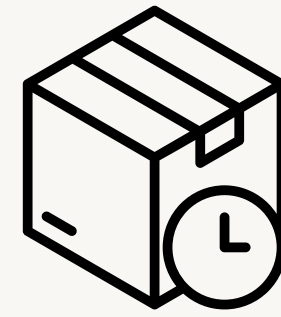


- **BIOROBOTS AND REMOTE-CONTROLLED MACHINES**

Due to the extremely high levels of radiation, human intervention was limited. Biorobots, which were remotely controlled machines and equipment, were used to clean and remove highly contaminated materials from the reactor and the surrounding areas.

# WHAT WAS WRONG ?

- Initial delay






- Lack of safety measures



- Lack of information



# INITIAL DELAY

- **Delayed Evacuation**  **Exposed tens of thousands of people to high levels of radiation**
- **Poor Management of Resources**  **Lack of mobilization**
- **Spread of contamination**  **Affecting soil, water sources, and plant life with contamination**



# LACK OF SAFETY MEASURES

- Cleanup workers, called **liquidators**, faced high radiation dangers due to **lack of protection gear**, raising their risk of cancer and other health issues.



- Much of the contaminated material from the cleanup efforts was **disposed of improperly**, such as by being buried in shallow trenches or dumped into nearby rivers. This led to the spread of contamination and further **environmental damage**.



# LACK OF INFORMATION

- Due to the Soviet Union's **culture of secrecy**, information concerning the Chernobyl disaster was tightly controlled, remaining largely undisclosed both internationally and domestically.
- **Residents** were not informed about the severity of the situation. Many were initially **unaware** of the **risks** associated with the nuclear disaster and continued with their daily activities.



# WHAT WAS RIGHT ?

- **Swift mass evacuation**
- **Mobilization of resources**
- **International Cooperation**



# LESSONS LEARNED

- **The Devastating Power of Nuclear Radiation**
- **The Importance of Transparency and Accurate Information**
- **The need for a global commitment to nuclear safety**

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