



## Radioactive Materials in Recycling Chain

**For Prelims:** International Atomic Energy Agency (IAEA), IAEA Nuclear Security Plan, Nobel Peace Prize, United Nation General Assembly, UPSC, IAS, Civil Services Examination.

**For Mains:** Issues Related to Radioactive Materials, International Atomic Energy Agency.

### Why in News?

The [International Atomic Energy Agency \(IAEA\)](#), has released its annual data on **illicit trafficking of nuclear and other radioactive material**.

- The data shows that **radioactive materials or contaminated devices** are entering into the **booming scraps recycling chain, posing a grave health hazard**.

### What does the IAEA Data Suggest?

- The **IAEA's Nuclear Security Plan** was established to **report incidents of illicit trafficking of nuclear and other radioactive material**.
- The latest dataset shows that **incidents of unauthorised disposal of radioactive sources** slipping into scrap metal or waste recycling industries are increasing.
  - The occurrence of such incidents indicates deficiencies in the systems to **control, secure and properly dispose of radioactive material**.
- The resulting contaminated metal, if used to **manufacture household goods**, could pose a **potential health problem to unsuspecting consumers**.
  - IAEA reported **146 incidents in 2022**, which is an increase of nearly 38% over the 2021 figure.

### What Measures can be Taken to Prevent Radioactive Materials from Entering the Recycling Chain?

- **Strengthen Regulatory Frameworks:** Governments need to strengthen their regulatory frameworks and enforcement mechanisms to ensure **proper handling, storage, and disposal of radioactive materials**.
  - This can include **stricter licensing requirements for facilities that handle radioactive materials**, and penalties for non-compliance.
- **Improve Monitoring and Control Mechanisms:** Governments should also invest in improving monitoring and control mechanisms to **prevent the illicit trafficking of nuclear and radioactive materials**.
  - This can include the **use of radiation detection equipment at borders and other points of entry**, and more **comprehensive tracking and reporting systems**.
- **Encourage the Use of Alternative Materials:** Governments and other stakeholders should encourage the **use of alternative materials that do not pose a risk of radioactive contamination** and promote the development of technologies to extract valuable materials from radioactive waste in a safe and sustainable manner.

## What is Radioactivity?

- Radioactivity is the phenomenon of **spontaneous emission of particles or waves from the unstable nuclei of some elements**. There are three types of radioactive emissions: **Alpha, Beta and Gamma**.
  - Alpha particles are positively charged **He (Helium) atoms**, beta particles are negatively charged electrons and gamma rays are neutral electromagnetic radiations.
- Radioactive elements are **naturally found in the earth's crust**. **Uranium, thorium and actinium** are three NORM (Naturally Occurring Radioactive Materials) series that contaminate water resources.
- Radioactivity is measured in **Becquerel (SI unit) or in Curie**. The unit **Sievert measures the quantity of radiation absorbed by human tissues**.

## International Atomic Energy Agency

- **About:**
  - Widely known as the world's **"Atoms for Peace and Development"** organisation within the [United Nations family](#), the IAEA is the international centre for **cooperation in the nuclear field**.
- **Establishment:**
  - The IAEA was created in 1957 in response to the deep fears and expectations generated by the **discoveries and diverse uses of nuclear technology**.
  - Headquarter: **Vienna, Austria**.
- **Objective:**
  - The Agency works with its Member States and multiple partners worldwide to promote safe, secure and peaceful use of nuclear technologies.
  - In 2005, it was awarded the [Nobel Peace Prize](#) for their work for a safe and peaceful world.
- **Functions:**
  - It is an independent international organisation that reports annually to the [United Nation General Assembly](#).
  - When necessary, the IAEA also reports to the [UN Security Council](#) in regards to instances of members' non-compliance with safeguards and security obligations.

### UPSC Civil Services Examination, Previous Year Question (PYQ)

**Q. In the Indian context, what is the implication of ratifying the 'Additional Protocol' with the 'International Atomic Energy Agency (IAEA)'? (2018)**

- (a) The civilian nuclear reactors come under IAEA safeguards.
- (b) The military nuclear installations come under the inspection of IAEA.
- (c) The country will have the privilege to buy uranium from the Nuclear Suppliers Group (NSG).
- (d) The country automatically becomes a member of the NSG.

**Ans: (a)**

**Source: DTE**

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