



Illegal Sale of Uranium

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Why in News

Two people were arrested under the **Atomic Energy Act, 1962** for possessing uranium without licence and selling it illegally.

On testing, the sample was **confirmed as natural uranium by Bhabha Atomic Research Centre (BARC)**.

Key Points

- **Uranium:**

- **About:**

- Uranium **occurs naturally in low concentrations** in soil, rock and water. It is a **hard, dense, malleable, ductile, silver-white, radioactive metal**.

- Uranium metal has a **very high density**.

- When finely divided, it **can react with cold water**. In **air** it is coated by **uranium oxide**, tarnishing rapidly.

- It can **form solids solutions and intermetallic compounds** with many of the metals.

- **Applications:**

- **Energy Production:** The main use of uranium in the civilian sector is to fuel commercial nuclear power plants for generation of **nuclear energy**.

- This requires uranium to be **enriched with the uranium-235 isotope** and the chain reaction to be controlled so that the energy is released in a more manageable way.

- **Making Atomic Bomb:** The first atomic bomb used in warfare was an uranium bomb.

- This bomb contained **enough of the uranium-235 isotope** to start a runaway chain reaction which in a fraction of a second caused a large number of the uranium atoms to undergo fission, thereby releasing a fireball of energy.

- **Used as Shield against Radiation:** Depleted uranium is also used as shield against radiation in **medical processes** using radiation therapy and also while **transporting radioactive materials**.

- Though itself radioactive, uranium's high density makes it effective in halting radiation.

- **Used as Counterweights in Industry:** Its high density also makes it useful as counterweights in aircraft and industrial machinery.

- **Radiometric Dating:** The **isotope uranium 238** is used to estimate the age of the earliest igneous rocks and for other types of radiometric dating.

- **Fertilizer: Phosphate fertilizers** are made from material typically high in uranium, so they usually contain high amounts of it.

- **Health and Environmental Impacts:**

- **Impact on Health:** Potentially depleted uranium has both chemical and radiological toxicity with the two important target organs being the **kidneys and the lungs**.

- **Impact on Environment:** Uranium mining facilities produce tailings that generally are disposed of in near surface impoundments close to the mine.

- These tailings pose serious environmental and health risks in the form of **Radon emission, windblown dust dispersal and leaching of contaminants** including heavy metals and arsenic into the water.

- **Uranium Deposits In India:**

- In India, Uranium deposits occur in the **Dharwar rocks**.
- It occurs along the **Singhbhum Copper belt (Jharkhand); Udaipur, Alwar and Jhunjhunu districts** of Rajasthan, **Durg district** of Chhattisgarh, **Bhandara district** of Maharashtra and **Kullu district** of Himachal Pradesh.
- Significant quantities of reserves have been recently discovered in parts of **Andhra Pradesh and Telangana** between Seshachalam forest and Sresailam (Southern edge of Andhra to Southern edge of Telangana).

- **Legal Framework in India:**

- In pursuance to **entry at serial No. 54 of List I (Union List)**, the Parliament has passed '**The Mines & Minerals (Development and Regulation) Act, 1957 (MMDR Act)**'.
 - However, with respect to **minor minerals**, the **rulemaking powers have been delegated to the States** through this Act.
 - Since Uranium is a major mineral, it is **managed by the Union Government** under provisions of **MMDR Act**.
- The policy and legislation relating to Major minerals are managed by the Ministry of Mines, but **Uranium being an atomic mineral is managed by the Department of Atomic Energy (DAE)**.

The **Atomic Energy Act, 1962** seeks to provide standards of controlling radioactive substances and plants and measures to prevent radiation accidents, retain public safety, assure cautious disposal of radioactive wastes, and so on.
- Many of these mineral deposits are found in rich forest reserves and thus **approval of the Union Ministry of Environment, Forest and Climate Change** becomes necessary.

Bhabha Atomic Research Centre

- Dr. Homi Jehangir Bhabha conceived the Nuclear Program in India. Dr Bhabha established the Tata Institute of Fundamental Research (TIFR) for carrying out nuclear science research in 1945.
- To intensify the effort to exploit nuclear energy for the benefit of the nation, Dr Bhabha established the Atomic Energy Establishment, Trombay (AEET) in January 1954 for a multidisciplinary research program essential for the ambitious nuclear program of India. AEET was renamed Bhabha Atomic Research Centre (BARC) in 1966.

Source: IE