IRAN'S WEAPON GRADE URANIUM : INTERNATIONAL RELATION

NEWS: *Iran's stock of near-bomb-grade uranium grows sharply, IAEA report shows*

WHAT'S IN THE NEWS?

The International Atomic Energy Agency (IAEA) has reported a significant increase in Iran's uranium enrichment to 60% purity, raising concerns about its potential nuclear weapons capability. The U.S. has pledged to pressure Iran, while the IAEA warns that diplomatic efforts to restrict Iran's nuclear activities are running out of time.

Iran's Uranium Enrichment and Global Response

Recent Developments

- A recent report by the International Atomic Energy Agency (IAEA) indicates that Iran's stock of uranium enriched to up to 60% purity has drastically increased.
- The United States has announced plans to pressure Iran over its nuclear program.
- The IAEA has warned that time is running out for diplomacy to impose new restrictions on Iran's nuclear activities.

Background: Joint Comprehensive Plan of Action (JCPOA)

The 2015 Iran Nuclear Deal

- JCPOA was signed in 2015 after prolonged negotiations between Iran and P5+1 (China, France, Russia, the United Kingdom, the United States, and Germany).
- Under the agreement, Iran agreed to:
    1. Significantly reduce its stockpiles of enriched uranium and heavy water.
    2. Implement a protocol allowing IAEA inspectors to access its nuclear sites, ensuring Iran would not develop nuclear weapons covertly.
- In return, Western nations agreed to lift sanctions related to Iran's nuclear activities.

2018 U.S. Withdrawal and Aftermath

- The Trump Administration withdrew from the JCPOA in 2018, citing concerns that the deal failed to address Iran's missile program and regional influence.
- Following the U.S. withdrawal, sanctions on Iran's banking and oil sectors were reinstated.
- Iran subsequently accelerated its nuclear program and enriched uranium beyond JCPOA limits.

Understanding Uranium Enrichment

Composition of Naturally Occurring Uranium

- **Natural uranium consists of three major isotopes:**
    1. Uranium-238 (99.284% natural abundance)

2. Uranium-235 (0.711%)
3. Uranium-234 (0.005%)

- The energy production in nuclear reactors occurs through the fission of Uranium-235 (U-235), as it is the only naturally occurring fissile material in significant quantities.

Process of Uranium Enrichment

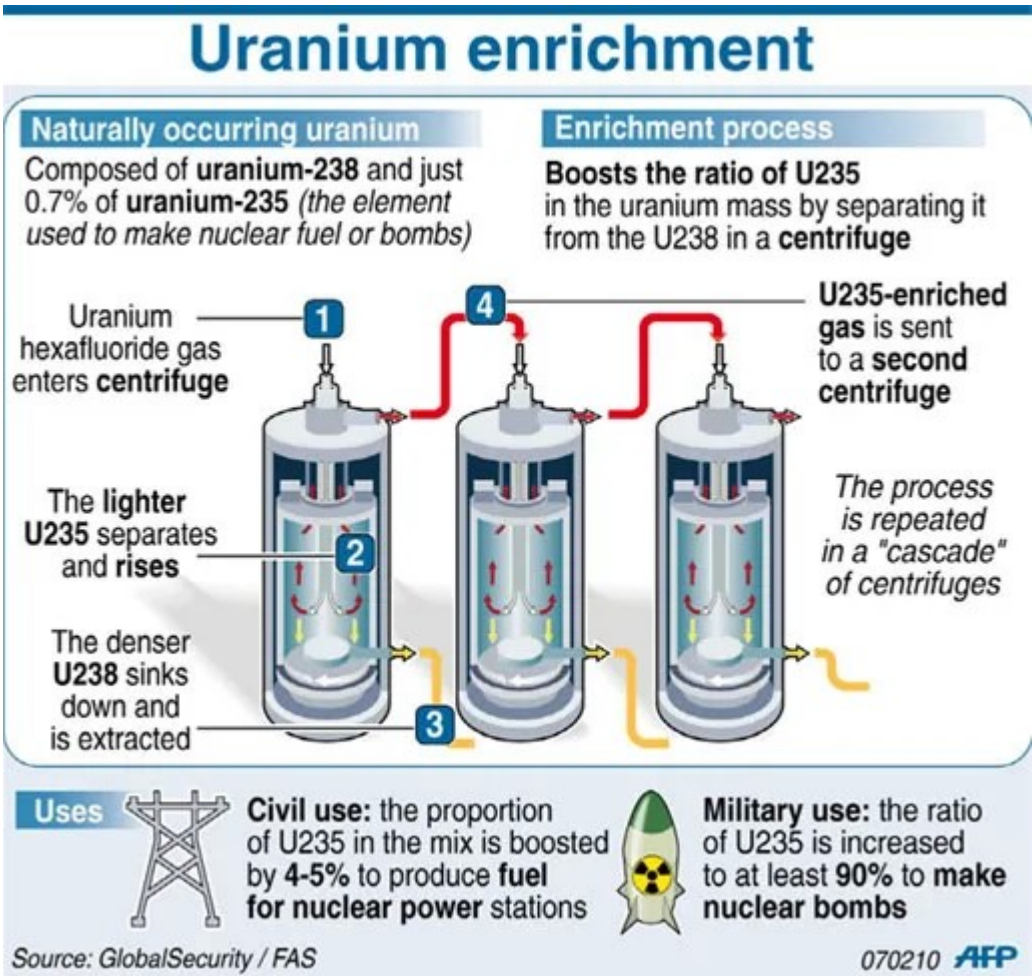
- Since natural uranium contains a low percentage of U-235, it undergoes isotope separation to increase U-235 concentration.
- The enrichment process makes uranium suitable for use in nuclear power generation and weapons production.

Uses of Enriched Uranium

- Enriched uranium is critical for both civilian and military applications:
    1. Civil Nuclear Power: Requires uranium enriched between 3% and 5% U-235.
    2. Nuclear Weapons: Requires uranium enriched above 90% U-235 (weapons-grade uranium).

Key Facts About Uranium

- Depleted Uranium (DU): The remaining U-238 after enrichment is known as depleted uranium. While it is less radioactive than natural uranium, it is still hazardous.
- Radiation Shielding: Depleted uranium is used as an effective radiation shielding material despite its mild radioactivity.
- IAEA Oversight: The International Atomic Energy Agency monitors uranium enrichment to ensure its use for peaceful purposes and to curb nuclear weapons proliferation.



Role of the International Atomic Energy Agency (IAEA)

Overview

- The IAEA is the leading international agency promoting the peaceful use of nuclear energy while ensuring nuclear safety and non-proliferation.
- Established in 1957 as an autonomous organization within the United Nations system.
- Reports to both the United Nations General Assembly and the UN Security Council.

Membership and Headquarters

- The IAEA has 180 member states.
- India is a founding member of the IAEA.
- Signature and ratification of the Nuclear Non-Proliferation Treaty (NPT) are not mandatory for IAEA membership.
- Headquarters located in Vienna, Austria.
- In 2005, the IAEA was awarded the Nobel Peace Prize for its efforts in promoting nuclear safety and preventing nuclear weapons proliferation.

IAEA's Additional Protocol

Purpose and Function

- The Additional Protocol (AP) is a legal agreement between the IAEA and a country, expanding the IAEA's ability to verify nuclear activities.
- It enhances transparency and ensures that nuclear material is not diverted for unauthorized use.

India's Position

- India signed the Additional Protocol in 2009, and it entered into force in 2014.
- The protocol applies only to nuclear facilities monitored by the IAEA.
- Non-safeguarded facilities, which are used for military purposes, remain outside its scope.

Conclusion

- Iran's increased uranium enrichment poses challenges to global nuclear stability and the effectiveness of diplomatic efforts.
- The U.S. is pushing for renewed pressure on Iran, while the IAEA warns of limited diplomatic opportunities.
- The role of the IAEA remains crucial in monitoring nuclear activities and ensuring that nuclear materials are not misused for weapons development.
- India, as a responsible nuclear power, continues to cooperate with the IAEA while maintaining its strategic nuclear autonomy.

Source: **https://www.thehindu.com/news/international/irans-stock-of-near-bomb-grade-uranium-grows-sharply-iaea-report-shows/article69266897.ece**