



Enriched Uranium Stockpile by Iran

Why in News

Recently, Iran's atomic agency said that **its stockpile of 20% enriched uranium** has reached over 210 kilograms.

- In April 2021, the [International Atomic Energy Agency](#) (IAEA) said Iran had begun the process of enriching uranium to 60% fissile purity at an above-ground nuclear plant at Natanz.
- Under the **historic 2015 nuclear deal** between Iran and the World Powers, **Iran was not meant to enrich uranium above 3.67%**. Enriched uranium above 90% can be used for nuclear weapons.

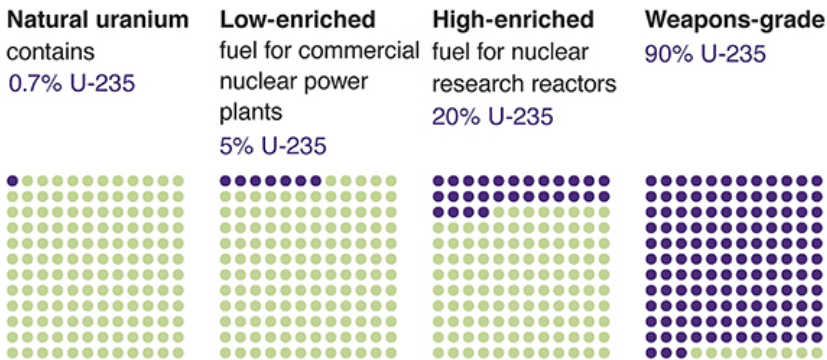
Key Points

- **Uranium Enrichment:**
 - **Natural uranium** consists of two different isotopes - **nearly 99% U-238** and only around **0.7% of U-235**.
 - **U-235 is a fissile material** that can sustain a chain reaction in a nuclear reactor.
 - **Enrichment process increases the proportion of U-235** through the process of isotope separation (U-238 is separated from U-235).
 - For **nuclear weapons**, enrichment is required upto **90% or more** which is known as weapons-grade uranium.
 - **Low-enriched uranium, which typically has a 3-5% concentration of U-235**, can be used to produce fuel for commercial nuclear power plants.
 - **Highly enriched uranium has a purity of 20% or more** and is used in research reactors.

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Uranium enrichment process

Increasing the concentration of **U-235** atoms, by removing **U-238**, means it can be used for nuclear fuel or bombs



Iran is limited to 3.67% U-235 under 2015 nuclear deal

How much effort is required to get to weapons-grade uranium?

Very little extra effort is needed to get from 20% enriched uranium to bomb material

83.5% effort needed to reach 4% U-235 > +8.5% effort needed to reach 20% U-235 > +8% more effort to reach 90% U-235

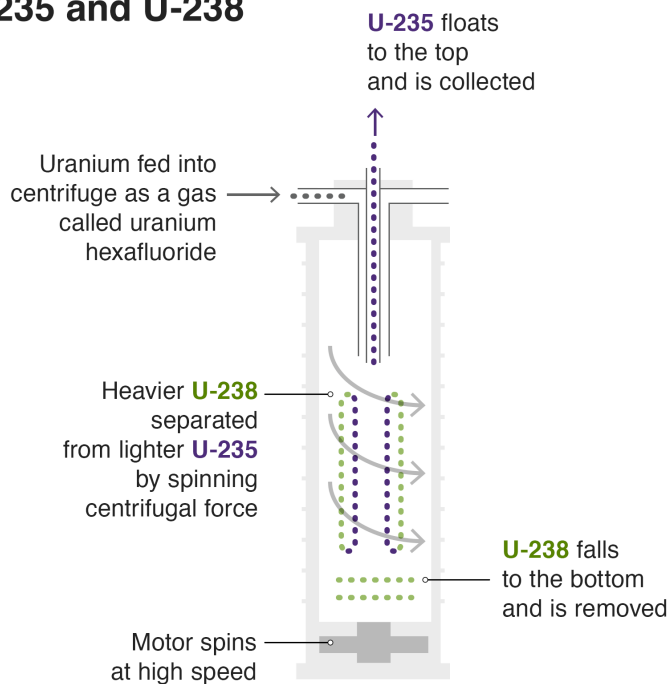


Associated Concerns:

- The tricky process of enrichment becomes far easier and requires fewer centrifuges as it moves into the higher purities.
- In other words, getting to 90% purity is much easier starting from 20%, and easier still starting from 60%.



How a centrifuge separates uranium atoms, U-235 and U-238



▪ 2015 Nuclear Deal:

- In 2015, **Iran with the P5+1 group of world powers** - the USA, UK, France, China, Russia, and Germany agreed on a long-term deal on its nuclear programme.
 - The deal was named as **Joint Comprehensive Plan of Action (JCPOA)** and in common parlance as Iran Nuclear Deal.
 - Under the deal, **Iran agreed to curb its nuclear activity** in return for the lifting of sanctions and access to global trade.
 - The agreement **allowed Iran to accumulate small amounts of uranium** for research but it **banned the enrichment of uranium**, which is used to make reactor fuel and nuclear weapons.
 - Iran was also **required to redesign a heavy-water reactor being built**, whose spent fuel would contain plutonium suitable for a bomb and to allow international inspections.
- **In May 2018, the USA abandoned the deal** criticising it as flawed and reinstated and tightened its sanctions.
 - Since sanctions were tightened, **Iran has been steadily breaking some of its commitments** to pressure the remaining signatories to find a way to provide sanctions relief.
- After months of delays, the **European Union, Iran and the US** have recently announced that **indirect talks to resuscitate the deal would resume on 29th November 2021 in Vienna.**

Iran's nuclear facilities covered under the nuclear deal



[Source: TH](#)

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