

Iran's Nuclear Programme: Strategic Sites and Growing Concerns

Introduction

Iran's nuclear programme has come under renewed global scrutiny due to its significant deviation from the 2015 Joint Comprehensive Plan of Action (JCPOA). With uranium enrichment levels far exceeding agreed limits, key nuclear facilities in Iran are once again central to geopolitical tensions in the Middle East.

Background

- The 2015 nuclear deal limited Iran's uranium stockpile and enrichment levels in exchange for sanction relief.
- The U.S. withdrawal from the deal in 2018 led Iran to gradually scale up its nuclear activities.
- As of mid-May 2025, Iran's enriched uranium stockpile has reached 9,247.6 kg—over 45 times the JCPOA limit.

Current Nuclear Capabilities

- **Weapons-Grade Material:** Iran possesses 408.6 kg of uranium enriched up to 60%, close to weapons-grade (90%).
- **Potential Nuclear Yield:** If further refined, Iran could theoretically produce material for about 10 nuclear bombs.
- **Official Stance:** Iran denies intentions to build nuclear weapons, maintaining its programme is for peaceful purposes.



Key Nuclear Sites in Iran

1. Uranium Enrichment Plants

- **Natanz:** Main enrichment facility; targeted by Israel in recent airstrikes. Operates around 70 cascades of centrifuges.
- **Fordo:** Underground site near Qom; particles enriched to 83.7% were found here, raising proliferation concerns.

2. Uranium Conversion & Research Reactors

- **Isfahan:** Converts uranium for centrifuge use; includes a fuel fabrication plant and a proposed research reactor.
- **Arak:** Heavy-water reactor originally halted under JCPOA; Iran aims to operationalize it by 2026 for medical research.
- **Tehran:** Home to a U.S.-supplied research reactor from 1967 for producing medical isotopes.

3. Nuclear Power Plants

- **Bushehr:** Operational since 2012 with Russian assistance; remains under IAEA supervision.
- **Darkhovin:** 300 MW plant under construction since 2022.
- **Sirik:** New complex of four reactors (total 5,000 MW) under development in the Strait of Hormuz (since 2024).

Way Ahead

- **Diplomatic Revival:** Re-engage Iran and global powers in dialogue to re-establish nuclear constraints.
- **Strengthened IAEA Monitoring:** Enhance the scope and frequency of inspections at all key sites.
- **Regional Dialogue:** Promote non-proliferation initiatives across the Middle East.
- **Sanction Rebalancing:** Conditional sanction relief to encourage compliance and transparency.

Conclusion

Iran's expanding nuclear programme and increasing stockpiles of enriched uranium have heightened regional and global security concerns. With facilities spread across strategic and often fortified locations, the programme poses complex challenges. Renewed diplomatic engagement and robust international oversight are essential to prevent further escalation and to ensure nuclear non-proliferation in the region.