

First Private Test facility for heavy water

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Why in News?

Recently, India's 1st private test facility for heavy water upgrade opened.

- **Pressurized Heavy Water Reactor (PHWR)** - It is a ***type of nuclear reactor*** that uses heavy water (deuterium oxide) as both a coolant and moderator.
- This design allows the reactor to utilize natural uranium as fuel, without the need for expensive fuel enrichment facilities.
- The heavy water is kept under pressure to prevent boiling, allowing for higher operating temperatures.
- D₂O needs to be 99.9% pure for working efficiently.
- But with time, it gets contaminated with light or regular water, requiring the depleted D₂O to be upgraded back to 99.9% using a distillation process.
- **Test facility done by** - TEMA India, a Mumbai-based private company.
 - **BARC** - Previously testing was done by the country's main nuclear research, Bhabha Atomic Research Centre (BARC).
- **Technology transfer** - BARC has transferred the indigenous technology to TEMA to build the vacuum distillations columns for upgradation of depleted heavy water.
- TEMA India will manufacture the components required for the distillation process and also test them to ensure they produce the right results.
- **1st Deployment** - The first batch of tested distillation column sections for deployment at Unit 8 of the Rawatbhata Nuclear Power Plant (RAPP-8) in Rajasthan.
- The company will also manufacture and test distillation equipment for the upcoming 4 nuclear reactors at Gorakhpur in Haryana and two at Kaiga in Karnataka.
- **India's nuclear Goals** - India has a goal to achieve 100 GW of installed nuclear energy capacity by 2047.
- To achieve 22.4 GW of installed capacity by 2032.
- The government launched Nuclear Energy Mission to develop Small Modular Reactors.

There are 24 nuclear reactors operational in India, with an installed capacity of 8,780 MW.

Reference

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