

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
UNSTARRED QUESTION NO - 2841
ANSWERED ON 05/08/2026

NUCLEAR ENERGY MISSION & BHARAT SMALL MODULAR REACTORS

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Will the PRIME MINISTER be pleased to state:-

- (a) the details of milestones under the Nuclear Energy Mission since the 20,000 crore allocation for Bharat Small Modular Reactors (SMRs) to reach 100 GW capacity by 2047;
- (b) the status of the 220 MW Bharat SMRs 55 MW SMRs and BARC-engineered High-Temperature Gas-Cooled Reactor for hydrogen production;
- (c) whether Shanti Swarup Bhatnagar-led reforms under the Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Act, 2025 are implemented to permit regulated private sector participation and if so, the details thereof; and,
- (d) the details of roadmap to operationalize five indigenous SMRs by 2033 including progress in manufacturing advanced reactor-vessel alloys via domestic industrial partnerships?

ANSWER

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS
AND PRIME MINISTER'S OFFICE (DR. JITENDRA SINGH)

- (a) Under the Nuclear Energy Mission announced in the Union Budget 2025–26, a total budgetary provision of Rs.20,000 crore has been allocated for the design, development and deployment of Small Modular Reactors (SMRs). This allocation is aimed at supporting India's objective of developing and operationalising at least five indigenous SMRs by 2033.

In this regard, Bhabha Atomic Research Centre (BARC) a constituent Unit of Department of Atomic Energy (DAE) has undertaken the design & development of demonstration units of SMRs, namely 220 MWe Bharat Small Modular Reactor (BSMR-200), 55 MWe Small Modular Reactor (SMR-55) for power generation, and a High Temperature Gas Cooled Reactor (HTGCR) having capacity up to 5 MW_{th}, for generation of process heat, which can be coupled with suitable thermochemical cycle for hydrogen production. These SMRs require 60 to 72 months for establishment after receipt of administrative & financial sanction.

- (b) BARC has undertaken the design and development of SMRs, namely 220 MWe Bharat Small Modular Reactor (BSMR-200), 55 MWe Small Modular Reactor (SMR-55), and High Temperature Gas Cooled Reactor (HTGCR) having capacity up to 5 MW_{th} for hydrogen production.

I. The BSMR-200 is an indigenous Pressurized Water Reactor (PWR) based power reactor. The current status of the BSMR-200 is mentioned below;

- (a) In-principle approval for engineering and construction of BSMR-200 has been received.
- (b) Proposal for Administrative & Financial sanction is cleared by Atomic Energy Commission (AEC) and the approval of Empowered Technology Group (ETG) has been obtained.
- (c) Atomic Energy Commission has approved Tarapur, Maharashtra as site for BSMR-200.

II. The SMR-55 is based on Pressurised Water Reactor design. The current status of the SMR-55 is mentioned below;

- (a) In-principle approval for engineering and construction of SMR-55 has been received.
- (b) Atomic Energy Commission has approved Tarapur, Maharashtra as site for SMR-55

III. HTGCR having power up to 5 MW_{th} is being designed and developed by BARC as nuclear heat source and to be coupled with a suitable thermochemical cycle,

such as copper-chlorine cycle, for hydrogen production. The current status of the HTGCR is mentioned below;

- (a) In-principle approval for engineering and construction of HTGCR has been received.
 - (b) The proposed site for the reactor is BARC, Vizag. Siting consent has been received.
 - (c) Terms of Reference (ToR) for obtaining environmental clearances has been received from the Ministry of Environment, Forest and Climate Change (MoEF&CC).
- (c) The recently enacted SHANTI 2025 Act (Sustainable Harnessing and Advancement of Nuclear Energy for Transforming India Act) proposes enabling legislative reforms to widen the participation of government owned as well as private entities in the Nuclear Energy sector for peaceful purposes towards achieving the ambitious goal of generating 100GW of nuclear power by the year 2047 for Vikshit Bharat. These reforms will come in to effect once the SHANTI Act is notified for its entry in to force.
- (d) The expertise of Indian industries in development, manufacturing and construction of indigenous pressurised heavy water reactors (PHWRs) has been leveraged for development and deployment of SMRs. Necessary technology for development and deployment of SMRs is available in the country, and the majority of equipment are within the manufacturing capability of Indian industries with technological handholding by BARC. The special material Advanced Purified Reactor Vessel Alloy (ApuRVA) and technology for forgings for reactor pressure vessels of BSMR-200 and SMR-55 have been developed indigenously in collaboration with Indian industries. Development of critical items such as reactivity control drive mechanisms has already been realised, while development of other critical equipment have been initiated with the domestic industry
