GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
LOK SABHA
STARRED QUESTION NO - 78
ANSWERED ON 04.02.2026

DEVELOPMENT OF SMALL MODULAR REACTOR

*78. SHRI ANURAG SINGH THAKUR
SHRI JAGDAMBIKA PAL

Will the PRIME MINISTER be pleased to state:-

(a) whether Small Modular Reactors (SMRs) are being prioritized by the Government for clean and reliable energy for country's long-term energy security;
(b) the details of the major advantages of SMRs over conventional reactors in terms of safety, flexibility, land requirement and suitability for remote or industrial applications;
(c) the details of the progress made so far in indigenous SMR design, fuel-cycle readiness and collaboration with the Indian industry;
(d) the manner in which SMRs are expected to contribute in achieving the Government's target of 100 GW nuclear capacity by 2047; and
(e) the manner in which the SHANTI Act aims to promote research, development and deployment of SMRs in the country?

ANSWER

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

(a) to (e) : A statement is laid on the Table of the House.

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Government of India
Department of Atomic Energy

STATEMENT REFERRED TO IN REPLY TO PART (A) TO (E) IN RESPECT OF LOK SABHA STARRED QUESTION NO.78 FOR REPLY ON 04.02.2026 REGARDING "DEVELOPMENT OF SMALL MODULAR REACTOR" ASKED BY SHRI ANURAG SINGH THAKUR AND SHRI JAGDAMBIKA PAL

(a) Nuclear energy is envisaged a clean and reliable energy source. Small Modular Reactors (SMRs) are prioritized for deployment in brownfield site as captive power plants for rapid decarbonization of energy intensive sectors, repurposing of retiring fossil fuel based power plants and deployment in remote location with no grid connectivity for catering to energy requirements.

(b) SMR is a promising technology in industrial de-carbonization especially where there is a requirement of reliable and continuous supply of power. SMRs can be deployed as captive plants for large industries repurposing of retired fossil fuel based power plants. As the exclusion zone required will be significantly lower due to enhanced safety, this, reduces the land requirement. They are suitable candidates for setting up in retired power plants, off grid areas also. SMRs can be engineered to have load follow characteristics for increasing flexibility of operation. SMRs, in general, has lower construction time and hence lower capital cost. Their design can be standardized for serial production.

(c) Under the Nuclear Energy Mission, Bhabha Atomic Research Centre (BARC), a Constituent Unit of Department of Atomic Energy (DAE) has recently initiated design and development of SMRs namely :

1. 220 MWe Bharat Small Modular Reactor (BSMR-200). The detailed project report has been approved and financial sanction is awaited. Various pre-project activities are under progress.

2. 55 MWe Small Modular Reactor (SMR-55). The proposal has been approved in-principle and design detailing is in progress. Design and development of major prototype equipment are in progress.

3. Up to 5 MWth high temperature gas cooled reactor meant for hydrogen generation. The detailed progress report (DPR) has been prepared and financial and administrative approval is being sought and design detailing is in progress.

DAE has acquired expertise across the complete front and back end of the nuclear fuel cycle through its experience with indigenous Pressurised Heavy Water Reactors **(**PHWRs). This expertise is being leveraged for pressurised water-based SMRs. Slightly Enriched Uranium (SEU) is considered as potential fuel for proposed SMRs. In case of domestic fuel, it is proposed to carryout reprocessing of spent fuel to recover valuable nuclear materials and reduce the overall nuclear waste burden. Broad philosophy of nuclear waste management remains same to reduce the overall nuclear waste burden i.e. recovery of useful radioisotopes, if any, volume reduction followed by vitrification of waste in stable glass matrix and storage in engineered facilities kept under surveillance at par with internationally accepted practices. However, in case of SMRs the reprocessing technology is to be re-engineered based on the fuel configuration.

DAE has requisite scientific & technological know-how for its design and development and majority of equipment are within manufacturing capability of Indian Industries with technological handholding by BARC.

(d) SMRs are being developed for deployment in brownfield sites with specific objectives of :

1. Repurposing of retiring fossil fuel-based power plants
2. Captive plants for energy intensive industries and
3. Off-grid applications for remote locations

The target of 100 GW nuclear capacity by 2047, can be achieved by deploying of large reactors such as 700 MWe indigenous PHWRs and large capacity imported advanced reactor designs at green field site. Where as SMRs are considered to be fit for rapid decarbonization of energy sector.

(e) The SHANTI Act allows any person to carry out research, development, design and innovation in matters related to nuclear energy radiation for the peaceful uses without obtaining a license. This provision aims to promote research, development and deployment of new reactor technologies in the country.

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