GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO. 486
ANSWERED ON 04/12/2025

NUCLEAR ENERGY MISSION

486. SHRI BHUBANESWAR KALITA

Will the PRIME MINISTER be pleased to state:-

(a) the main features of Nuclear Energy Mission for Viksit Bharat and the manner in which it aims to achieve 100 GW of nuclear power capacity by 2047 through indigenous technologies and advanced reactor designs;

(b) the current status of Small Modular Reactor (SMRs) development projects proposed for completion by 2033 and their expected role in industrial de-carbonisation and clean energy generation;

(c) the current installed nuclear power capacity along with the status of Kakrapar Units 3 and 4 and Rajasthan Atomic Power Project Unit-7, and future plans for capacity expansion; and

(d) the updates on uranium exploration and domestic fuel supply, including recent findings in Jaduguda and the safety measures adopted to meet international standards ?

ANSWER

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

(a) The Nuclear Energy Mission for Viksit Bharat is aiming to achieve nuclear power generation capacity of 100 GWe by 2047 to contribute significantly in achieving the target of NetZero by 2070. Its main features are to augment power production from nuclear energy with least carbon emission, provide reliable energy alternative for catering the base load requirement which is currently provided by fossil fuel base power plants.

Another feature of the Nuclear Energy Mission is to increase the share of nuclear energy in India's energy mix for Viksit Bharat, with emphasis on indigenous nuclear technology.

To achieve the 100 GW target, India has two-pronged strategy with respect to nuclear energy;

1) Establishing large reactors such as 700 MWe indigenous Pressurised Heavy Water Reactors (PHWRs) and large capacity imported reactors at green field sites for rapid expansion.

2) Small reactors such as 200 MWe Bharat Small Modular Reactor (BSMR-200) and 55 MWe Small Modular Reactor (SMR-55), are being designed & developed for brown field sites, with objective of,

   i. Repurposing of retiring fossil fuel-based power plants,
   ii. Captive plants for energy intensive industries and
   iii. Off-grid applications for remote locations.

Necessary technology for deployment of these reactors is available in the country and majority of equipment are within manufacturing capability of Indian industries with technological handholding by Bhabha Atomic Research Centre (BARC). The mission is further supported by R&D with objective to develop indigenous advanced reactors comprising safety features, its fuel cycles and hydrogen production for decarburising transport sector & process industry.

(b) BARC has initiated design and development works on SMRs namely,

1. Bharat Small Modular Reactor 200 MWe,
2. SMR 55 MWe, and
3. Up to 5 MWth High temperature gas cooled reactor meant for hydrogen generation.

It is proposed to construct the lead units of these reactors at DAE site for technology demonstration. The demonstration reactors are likely to be constructed in 60 to 72 months after receipt of project sanctions

BSMR-200 and SMR-55 can be deployed as captive plant for energy intensive industries such as aluminum, steel, metal etc., repurposing of retiring fossil fuel-based power plants and for providing energy for remote as well as off-grid locations. Whereas, hydrogen produced from high temperature gas cooled reactors can be utilized in transport sector and process industries. Thus, these SMRs are positioned as key contributors for decarbonisation of power, energy intensive industries and transport sector and for clean energy generation in the coming decade.

(c) Kakrapar Units 3&4 (2X700 MW) and Rajasthan Unit-7 (700 MW) are already in commercial operation. Nuclear Power Corporation of India Limited (NPCIL)'s capacity expansion plans envisage reaching a nuclear power capacity of about 22 GW on completion of projects presently under implementation by 2031-32 and about 54 GW by 2047 from 8.78 GW (excluding RAPS-1) at present.

(d) As on September, 2025, Atomic Minerals Directorate for Exploration and Research (AMD) has established 4,36,700t *in-situ* U_3O_8 resource in 47 uranium deposits located in Andhra Pradesh, Telangana, Jharkhand, Meghalaya, Rajasthan, Karnataka, Chhattisgarh, Uttar Pradesh, Uttarakhand, Himachal Pradesh and Maharashtra.

In recent years, AMD has established 28,637t *in-situ* U-oxide resource at Jaduguda North - Baglasai - Mechua deposit, East Singhbhum district, Jharkhand; which is the north-western continuity of Jaduguda uranium deposit.

Atomic Energy Regulatory Board (AERB) monitors the radiological safety aspects in uranium mining and milling activities, including waste management. Any new project starting from mine development, siting of ore processing plant, etc. are subject to multi-stage safety review by AERB in accordance with its regulatory requirements. Also, AERB carries out regulatory inspections of these facilities to verify compliance with the regulatory requirements. The regulatory requirements of AERB take into account the safety standards of International Atomic Energy Agency (IAEA).

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