

GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY
RAJYA SABHA
UNSTARRED QUESTION NO-12
ANSWERED ON 29/01/2026

STRATEGY FOR NUCLEAR WASTE MANAGEMENT

12. DR. FAUZIA KHAN

Will the PRIME MINISTER be pleased to state :-

- (a) whether Government has undertaken any comprehensive review of India's nuclear waste management systems, in the light of targets to achieve 100 GW nuclear capacity by 2047;
- (b) if so, whether it has assessed the long-term adequacy of existing on-site disposal and interim storage arrangements, particularly for high-level radioactive wastes;
- (c) whether any proposal has been finalized for establishing a deep-geological repository for long-term storage of high-level radioactive wastes; and
- (d) the timeline and institutional framework proposed to ensure safe and permanent disposal of nuclear wastes from existing and forthcoming reactors including SMRs?

ANSWER

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

- (a) & (b) Yes, management of nuclear waste that will be generated from the planned expansion to 100 GW by 2047 will be in line with current waste management practices.

Waste management philosophy adopted by Department of Atomic Energy (DAE) ensures that no waste, in any physical form, is released/disposed to the environment unless the same is cleared, exempted or excluded from regulation.

India follows a nearly closed nuclear fuel cycle, where spent fuels from domestic sources are reprocessed to recover the useful element for recycle/reuse and thereby, reduce the burden of radioactive wastes. The fissile element recovered from reprocessing of spent fuel is recycled back as a fuel for future reactors. High-level radioactive waste, amounting to a very small percentage of the spent fuel, generated during reprocessing is then immobilised into an inert glass matrix

by vitrification and placed in Solid Storage Surveillance Facilities for interim storage.

The waste management practices, involving interim storage, treatment and disposal, being followed in India are at par with international practices and as per the guidelines of International Atomic Energy Agency. With the expansion of nuclear power in India, as per the site conditions either capacity of the existing waste management facilities will be enhanced or new facilities will be constructed in order to ensure the safety of the public and the environment.

The current capacities of Near Surface Disposal Facilities (NSDF) at existing sites are adequate for safe storage of the waste generated at Nuclear Power Plants.

- (c) Research and development on partitioning technologies for management of high-level waste is in progress. The technology facilitates for the segregation of long-lived radioactive constituents including actinides and extraction of useful radioisotopes from high level radioactive waste for societal application which will result in significant reduction of waste-volume prior to vitrification. Hence requirement of establishing a deep geological repository in near future is not anticipated.
- (d) In India, research and development activities are being pursued to incinerate long-lived actinides separated from high level waste to inactive or short-lived radioactive wastes using high energy accelerators and fast reactors. DAE has active programs for both these options in its Amritkal Targets. The success in these technologies is expected to eliminate the need for any permanent disposal facility for high-level nuclear waste in long term.

Slightly enriched uranium (SEU) is considered as potential fuel for small modular reactors (SMRs). The broader philosophy of nuclear waste management, for domestic fuel for SMRs, remains same to reduce the overall nuclear waste burden through recycling of domestic fuel, recovery of useful radioisotope (if any), volume reduction followed by vitrification in stable glass matrix and storage in Solid Storage Surveillance Facilities for interim storage.
