GOVERNMENT OF INDIA
DEPARTMENT OF ATOMIC ENERGY

LOK SABHA
UNSTARRED QUESTION NO – 4455
ANSWERED ON 20/08/2025

NUCLEAR WASTE MANAGEMENT

4455. SHRI RAO RAJENDRA SINGH

Will the PRIME MINISTER be pleased to state:-

(a) whether the Government has any strategy for managing nuclear waste that will be generated from the planned expansion to 100 GW by 2047 and if so, the details thereof;

(b) whether there is any data on the current inventory of nuclear waste at various facilities across the country and if so, the details thereof;

(c) whether the Government has established any permanent disposal facility for high-level nuclear waste in the country and if so, details thereof;

(d) if not, whether the Government is planning to establish the same anywhere in the country and if so, the details thereof; and

(e) whether the Government has allocated any specific budget for nuclear waste management in the Nuclear Energy Mission announced during Budget 2025-26 and if so, the details thereof?

ANSWER

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

(a) Yes, management of nuclear waste that will be generated from the planned expansion to 100 GW by 2047 is in line with current waste management practice. Nuclear wastes arising from nuclear power plants and fuel cycle facilities are safely disposed/managed under the provisions of "The Atomic Energy Act. 1962", subsequent amendments and the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules 1987. As a waste management philosophy, no waste in any physical form is released/disposed to the environment unless the same is cleared, exempted or excluded from regulations.

A comprehensive radioactive waste management is established taking into account the operational capability for the management of radioactive waste and an independent regulatory capability for its overview. Radioactive wastes generated at nuclear power plants, during their operation, are of low & intermediate activity level and are managed

at the site itself. These wastes are treated, concentrated, compacted, immobilized in solid materials like cement and disposed in specially constructed structures such as reinforced concrete trenches and tile holes, located at the site. The disposal facilities are kept under constant surveillance with the help of bore-wells laid out in a planned manner by routinely monitoring the underground water and soil samples to confirm effective confinement of radioactivity present in the disposed waste. This practice is at par with international practices following the guidelines of International Atomic Energy Agency (IAEA).

Post 2025-26 budget announcement, a Roadmap for achieving the goal of 100 GW of Nuclear Capacity by 2047 has been actively deliberated by a committee that has reviewed all the relevant aspects, including management of nuclear waste.

For successful lift-off of Nuclear Energy Mission, a host of ground-preparatory activities are to be completed, say within a tight time frame of 5 to 7 years, towards policy, legal and regulatory reforms, in all related areas of nuclear power generation including Spent Fuel Reprocessing & Waste Management, among others.

(b) Typically, radioactive solid wastes arising from nuclear power plants which are to be disposed at site during the life time including decommissioning is within 0.15 cubic meters/year/MW. Records of radioactive wastes are regularly filed with regulatory authority regarding quantity and location of such waste disposed.

(c)& (d) India follows a closed nuclear fuel cycle for recovery of fissile material and reduce the burden of nuclear waste management, where domestic spent fuel is reprocessed and most of its components are recycled back as fuel for future reactors. High-level radioactive waste generated during reprocessing is immobilised into an inert glass matrix by vitrification and stored in Solid Storage Surveillance Facilities for interim storage at par with international practices following the guidelines of International Atomic Energy Agency (IAEA). Research and development are in progress on partitioning technologies, for recovery of long-lived radioactive constituents and separation/ extraction of the useful radioisotopes for societal application for waste volume reduction, and incineration of long-lived actinides to inactive or short-lived radioactive wastes is likely to obviate the need for a Long-Term Disposal in the decades to come.

(e) Nuclear Energy Mission announced during Budget 2025-26 intends to create an outlay of INR 20,000 Crores, specific to development of SMRs which will cater to the funding requirement for Research & Development. The mission of 100 GW by 2047 and associated fuel cycle activities (includes nuclear waste management) will require an enormous funding to carry out its implementation which has to be met by extra-budgetary resources as well as private financing. To ease the massive funding requirements for unprecedented nuclear energy growth, at the policy level Nuclear energy's role as part of climate action is recognized in India's Climate Finance Taxonomy (Draft), which will make nuclear eligible for climate finance, thereby easing out the requirement for finance in bringing new nuclear plants and associated fuel cycle facilities.

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