GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

UNSTARRED QUESTION NO:4075
ANSWERED ON:19.02.2014
MANAGEMENT OF NUCLEAR WASTE
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Will the Minister of ATOMIC ENERGY be pleased to state:

(a) whether the Government has made any assessment of the quantity of nuclear waste generated by the Nuclear Power Plants (NPPs) in the country;

(b) if so, the details and the outcome thereof along with the technology being used in the country for the management of nuclear waste;

(c) whether the Government proposes to launch a programme for development of a process for high level waste management; and

(d) if so, the details thereof along with the action taken in this regard?

Answer

THE MINISTER OF STATE FOR PERSONNEL, PUBLIC GRIEVANCES & PENSIONS AND PRIME MINISTER'S OFFICE (SHRI V. NARAYANASAMY) :

(a) Yes, Sir.

(b) The Government is using latest technology for management of nuclear waste generated during operation of nuclear power plants. The details are as follows:

(i) The low and intermediate level radioactive waste generated during operation and maintenance of nuclear power plants is segregated, its volume reduced using various technologies and solidified. This solid/solidified waste is packaged in suitable containers to facilitate handling, transport and disposal.

(ii) Disposal of low and intermediate level waste is carried out in specially constructed structures such as stone lined trenches, reinforced concrete trenches and tile holes. These disposal structures are located both above and underground in access-controlled areas. Disposal system is designed based on multi barrier principle for ensuring effective containment of the radioactivity. The areas where the disposal structures are located are kept under constant surveillance with the help of bore-wells laid out in a planned manner.

The underground soil and water samples from these bore wells are routinely monitored to confirm effective confinement of radioactivity present in the disposed waste.

(iii) Gaseous waste is treated at the source of generation. The techniques used are adsorption on activated charcoal and filtration by high efficiency particulate air filters. The treated gases are then diluted with exhaust air and discharged through a tall stack with monitoring.

(iv) Liquid waste streams are treated by various techniques, such as filtration, adsorption, chemical treatment, thermal and solar evaporation, ion exchange, reverse osmosis etc. The concentrate from treatment of liquid waste are immobilised in inert materials like cement, polymer etc.

The nuclear waste handling, treatment, storage and disposal is carried out as per the well laid down procedures and guidelines stipulated by the Atomic Energy Regulatory Board (AERB).

(c) High level waste is managed in the country by a well-established process called vitrification. Vitrification plants are in operation at Trombay, Tarapur & Kalpakkam for more than two decades.

(d) During reprocessing of spent fuel, 2-3 percent of spent fuel becomes waste and the rest is recycled. This 2-3 percent waste is called high level waste (HLW). A three step strategy is adopted in India for management of HLW which involves :

(i) Immobilising high level liquid waste into inert solid glass matrix. This process of converting high level liquid waste into solidified glass matrix is called 'vitrification'.

(ii) Interim storage & cooling of these vitrified waste products in specially designed storage vaults for a period of 30-40 years. This is to dissipate the heat generated on account of decay of fission products associated with these waste products.

(iii) Disposal of vitrified waste products in well-engineered disposal facilities after this storage period of 30-40 years.