GOVERNMENT OF INDIA
ATOMIC ENERGY
LOK SABHA

UNSTARRED QUESTION NO:2841
ANSWERED ON:10.12.2014
NUCLEAR WASTE DISPOSAL
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Will the Minister of ATOMIC ENERGY be pleased to state:

(a) the amount of nuclear waste being generated in the country;

(b) the current method of nuclear waste disposal and the sites being used for nuclear waste disposal;

(c) whether there are any environmental repercussions associated with the current method of nuclear waste disposal and if so, the details thereof;

(d) the details of environmental rules regulating disposal of spent fuel;

(e) whether there is any requirement for conducting an environmental assessment before determining sites for nuclear waste disposal and if so, the details thereof; and

(f) whether nuclear generation is expected to grow in the country 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) Nuclear waste is generated primarily from two kinds of facilities viz. Nuclear Power Plants (NPPs) and Spent Fuel Reprocessing Facilities. The spent fuel is not considered a waste in India. Spent fuel generated from NPPs is cooled for a minimum period of 5 years before taking it up for reprocessing. During the reprocessing of spent fuel for recovery of valuable elements, the very small quantity of radioactive fission products (waste) is isolated.

This waste is immobilised in suitable glass matrix in solid form through vitrification and stored in interim storage facility for initial cooling & surveillance prior to their eventual emplacement in geological disposal facility. At present, the amount of such waste generated in India is around 4 Tonnes per GW-year (1000 MW produced for one year) electricity generation, which is similar to the amount of wastes generated internationally by other countries.

(b) Management of radioactive waste in the Indian context includes all types of radioactive wastes generated from the entire nuclear fuel cycle and also from installations using radionuclides in medicine, industry and research. In the choice of processes and technologies adopted utmost emphasis is given to waste minimisation and volume reduction. The comprehensive radioactive waste management operations are carried out fulfilling all prescribed regulatory requirements.

Safe management of nuclear waste has been accorded a high priority right from the inception of our nuclear energy programme. Nuclear waste in gaseous, liquid and solid forms is generated during operation & maintenance activities of nuclear facilities. The processing technologies adopted for management of nuclear waste are summarised below:

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

(2) Liquid waste streams are treated by various techniques, such as filtration, adsorption, chemical treatment, evaporation, ion exchange; reverse osmosis etc., depending upon the nature, volume & radioactivity content. The emphasis is on volume reduction and the concentrate generated therefore is immobilised in inert materials like cement, etc.

(3) The radioactive solid waste generated during operation and maintenance of nuclear facilities are segregated and volume is reduced using various technologies like compaction and incineration. The solid/solidified waste is packaged in suitable containers to facilitate handling, transport and disposal. Disposal of waste is carried out in specially constructed structures such as stone lined trenches, reinforced concrete trenches and tile holes.

(4) India has adopted closed fuel cycle option, which involves reprocessing and recycling of the spent fuel. During reprocessing, only about two to three percent of the spent fuel becomes waste and the rest is recycled. This waste, called high level waste (HLW), is converted into glass through a process called vitrification. The vitrified waste is stored in a Solid Storage Surveillance Facility for 30-

40 years with natural cooling prior to its disposal in a final disposal facility. The need for a final disposal facility will arise only after three to four decades. This will also provide sufficient time for the reduction in the radioactivity of some of the short-lived radioactive species in the vitrified waste.

(c) No, Sir.

(d) India has adopted closed fuel cycle option, which involves reprocessing and recycling of the spent fuel. The spent fuel, as such is not disposed. Any radioactive waste generated during the treatment processes of reprocessing is disposed following the Atomic Energy (Safe Disposal of Radioactive Wastes) Rules, 1987 promulgated under the Atomic Energy Act, 1962 and the regulatory requirements laid down by Atomic Energy Regulatory Board (AERB).

(e) The nuclear power projects require prior environmental clearance from Ministry of Environment & Forests in accordance with the Environment Protection Act 1986 and the rules made thereunder. Additionally, AERB grants clearance to NPP Site after reviewing potential radiological impacts, including nuclear waste disposal facility. During siting stage itself, radiological impact assessment is carried out and the report is reviewed by AERB.

The Ministry of Environment & Forests has issued the Environmental Impact Assessment Notification, 2006, which makes environmental clearance mandatory for any new nuclear project. In addition, provisions under Atomic Energy Act, 1962 along with Rules promulgated thereunder and AERB Code on siting are in force with regard to radiological impact assessment and clearance from AERB is mandatory in this regard.

(f) The current installed nuclear power capacity of 4780 MW will reach 10080 MW by 2019 with the progressive completion of projects under construction and commissioning. A roadmap has been drawn to launch 19 reactors with an aggregate capacity of 17400 MW progressively in near and mid-term.