

NUCLEAR WASTE MANAGEMENT



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INTRODUCTION

WHAT IS NUCLEAR WASTE ?

- Nuclear wastes are wastes that contain radioactive material. Nuclear wastes are usually by-products of nuclear power generation and other applications of nuclear fission or nuclear technology



NUCLEAR WASTES CLASSIFICATION

➤ Nuclear wastes categories-

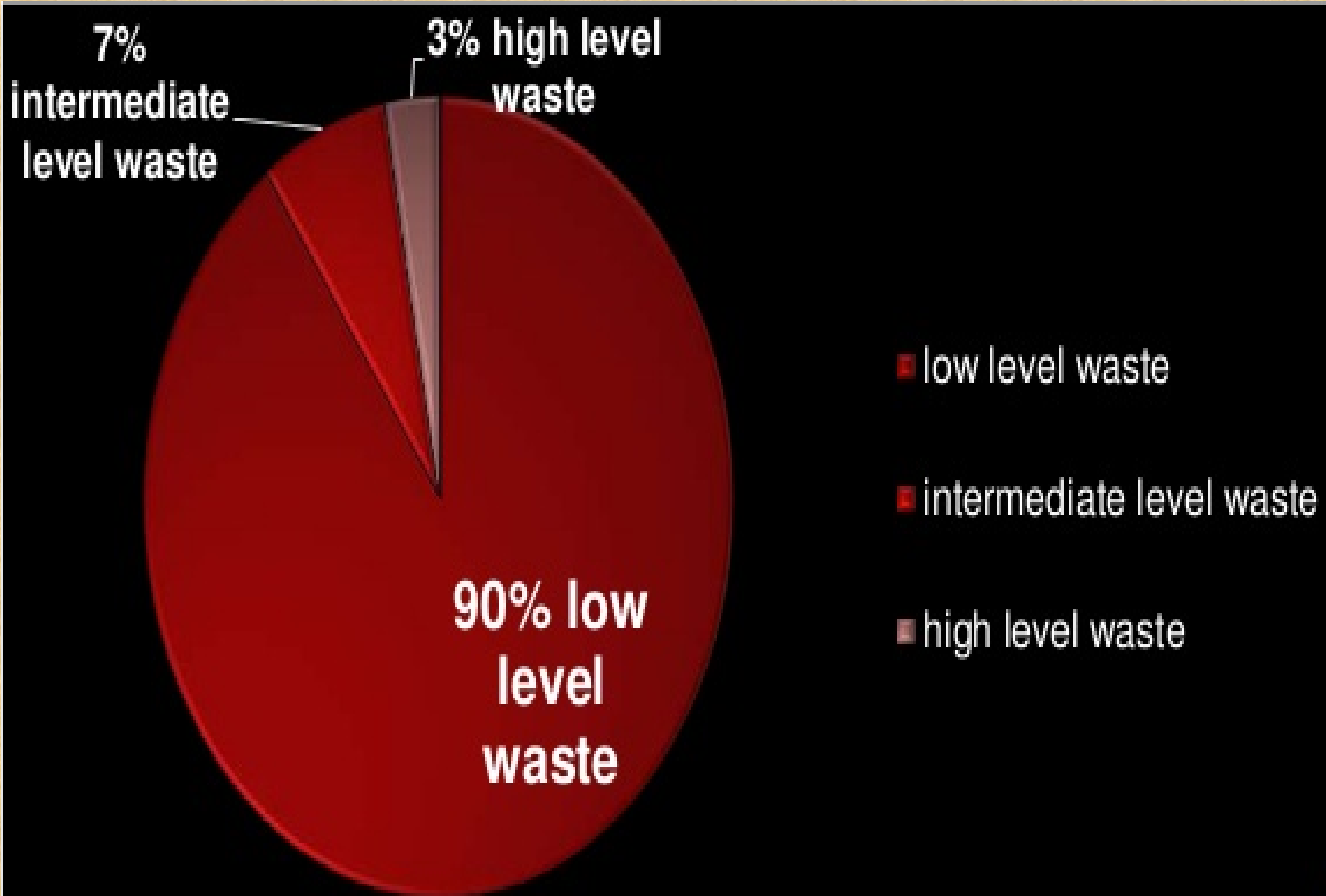
1.Solid wastes

2.Liquid wastes

3.Gaseous wastes

NUCLEAR WASTES CLASSIFICATION

- Classification on the basis of radioactivity
 - 1.High level wastes
 - 2.Medium level wastes
 - 3.Low level wastes



Ways for Disposal of Wastes

➤ Liquid Waste – The disposal of liquid wastes is done in two ways:

1. Dilution – The liquid wastes are diluted with large quantities of water and then released into the ground. This method suffers from the drawback that there is a chance of contamination of underground water if the dilution factor is not adequate.

- 2. Concentration to small volumes and storage –
When the dilution of radioactive liquid wastes is not desirable due to amount or nature of isotopes, the liquid wastes are concentrated to small volumes and stored in underground tanks. The tanks should be of assured long term strength and leakage of liquid from the tanks should not take place otherwise leakage of contents, from the tanks may lead to significant underground water contamination.



➤ Gaseous Waste –

Gaseous wastes can most easily result in atmospheric pollution. Gaseous wastes are generally diluted with air, passed through filters and then released to atmosphere through large chimneys.



➤ Solid Wastes – Solid wastes consists of scrape material or discarded objects contaminated with radioactive matter. These wastes if combustible are burnt and the radioactive matter is mixed with concrete, drummed and shipped for burial. Non-combustible solid wastes, are always buried deep in the ground.





Nuclear waste symbol

Disposal of low level wastes

- Low level radioactive waste consists of:
 1. Contaminated solids
 2. liquids
 3. animal carcasses
 4. small sealed sources
- Radioactive animal carcasses are either incinerated or buried onsite.
- The nuclear wastes is cast in cement in steel drum and are buried either or kept at the bed of oceans.
- 90% of wastes are of low level quality.



Disposal of medium level wastes

- Medium level waste requires shielding when being handled.
- 7% volume of wastes.
- Dependent on the amount of activity it can be buried in shallow repositories.
- These wastes are mainly contaminated with neutron activation product isotopes.

Disposal of high level wastes

- High level waste has a large amount of radioactive activity and is thermally hot.
- 3% volume of waste
- 95% of radioactivity
- Current levels of HLW are increasing about 12,000 metric tons per year.
- Most HLW consists of Pu-238, 239, 240, 241, 242, Np-237, U-236



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Thank You