

# RADIOACTIVE WASTE MANAGEMENT OF URBAN AREA

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## Radioactive Waste Management

Radioactive waste is defined as waste consisting wholly or partly of a substance or article which, if it were not waste, would be radioactive material, or a substance or article that has become contaminated by radioactive material or waste so as to make it radioactive or to increase the radioactivity it already possesses. Radioactive waste arises from the use of a number of nuclear technologies, and the use of radioisotopes in industry, medicine and scientific research.

Radioactive wastes generated in urban area would be treated with further concern in the respect of radiation and environmental protection, which are envisaged, particularly with the potential threat of radioactive or mixed hazardous wastes. It is also very important to note when discussing the issue of radioactive waste that stocks of such material already exist in some area, and will need to be disposed in a safe, economic and socially acceptable way in urban area. This is not an awesome task, and in fact, the technical and logistical aspects of it are quite manageable. The greatest obstacle in implementing a waste disposal system is the social and legislative aspects, which stem from the responsibility of organisation of waste producers, public misconceptions of the nature of radioactive material, the risks involved in its transport and disposal, and the establishment of more strict and practicable legislation and policy of radioactive waste management as well.

In contrast with the amount of toxic chemical wastes and domestic wastes in urban area, the quantities of radioactive wastes to be disposed are relatively quite small. This means that the scale of facilities needed for their disposal will not have to be extraordinarily large, and also that much more caution and concern can be put into the design of an effective and safe system to manage them. In this respect, there is a need for a professional organisation to undertake the necessary regulation, and demonstrate that high standards of design, planning, management and operation could be met.

The local authority responsible for management of radioactive wastes in urban area, is such a professional organisation in accordance with the relevant national and local directories or regulations. The statutory task of the organisation is to prevent and limit any harmful effects associated with the radioactive waste. The main emphasis in research and development performed at the organisation is on treatment, disposal and management of radioactive waste in the living and working environment.

In line with the overall policies, regulations and directories, waste producers carry the direct responsible for packing the waste in the manner that meets the requirements for safe transport to and disposal at repositories to be developed and operated by the authority organisation. However, in order to ensure a coherent overall the waste management scheme, the authority organisation is coordinating the development of packing standards and guidelines, and developing an integrated transport system.

### Radioactive Wastes Disposal Centre of Shanghai (RWDC)

Radioactive Wastes Disposal Centre of Shanghai (RWDC) has been set up by the Shanghai Municipal Bureau of Environmental Protection to provide a common approach to the centralised management of intermediate level and low level radioactive wastes (ILRWs and LLRWs) in Shanghai area, and it is under the administrative control of National Agency of Environmental Protection (NAEP). The principal activities of RWDC as a local executive authority are:

- to inspect, test and licence equipments and establishments generating radiation or containing radioactive sources,
- to carry out the studies relating to the development of disposal facilities for intermediate level and low level radioactive waste,
- to develop the risk assessment techniques which appropriate to waste disposal systems,
- to develop the procedures for checking the content of solid radioactive waste, and research on waste treatment options, and
- to survey the radioactive background and contamination of the environment.

With exceptional facilities and experts, for undertaking scientific and technical work to the highest standards in the country, RWDC is currently doing:

- solidification of liquid wastes,
- cremation of organic wastes,
- dried-out of the animal corpse,
- package and storage of solid wastes,
- storage of radioactive sources
- decontamination of devices,
- waste transportation, and
- training and consultation of radiation protection and waste management.

The several years experience of above activities shows that the model of RWDC, i.e. the centralised management, is quite successful and effective, as a local authority and regulation organisation to carry out the radioactive waste management. The model of RWDC is suitable to manage and dispose radioactive waste generated from the civil applications in urban area, and valuable to the developing country and area in particular. It is concluded that the centralised management of intermediate level and low level radioactive waste (ILRWs and LLRWs) is an optimum choice for the urban area.

### Case Report: Packing and Transporting-



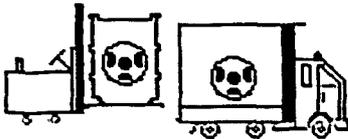
Stainless steel drum for liquid waste



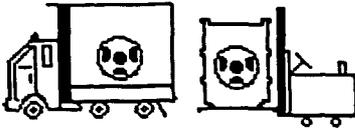
High strength polymer drum with two high strength steel bolts for solid waste



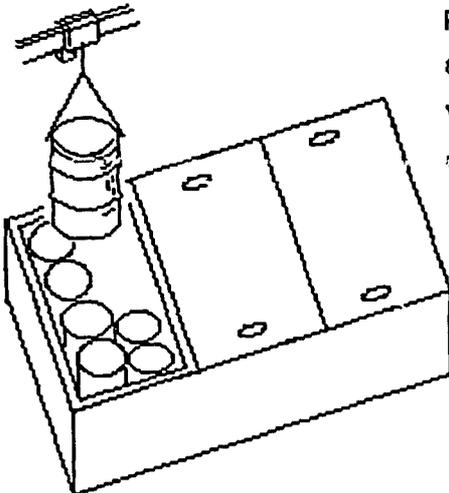
Containing immobilised waste material



Loading drum into a special transport container



Unloading drum at repository



Placing drum into repository, a conventional top lidded approach with different cover thickness to accommodate the shielding requirement of the various waste streams

All repositories are located within a single and indoor site