

The IAEA Safety Requirements for Disposal of Radioactive Waste

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Abstract

Considerable progress has been made in the development of safety standards for the disposal of radioactive waste in recent years. In 2008 work was completed on the development of a revised classification scheme for radioactive waste, which is both comprehensive; including all types of radioactive waste, and provides a clear linkage between different waste types and disposal options.

This development assisted greatly with the agreement on a suite of safety standards for disposal headed by a new safety requirements standard for all classes of radioactive waste and complemented by a number of safety guides which provide recommendations and guidance to meet the requirements for the different waste disposal options. The Safety Requirements standard for disposal uses the new format for standards, with a discrete set of clearly defined, precise requirements.

The supporting safety guide documents are being developed to illustrate how the various safety functions are to be provided by the different disposal options together with the extent and depth of provision of the different safety functions needed by the different disposal types to meet the safety requirements. Supporting these guidance document are a number of Safety Guide documents that address the demonstration and assurance of safety for disposal. These are made up of a guide on the safety case and supporting assessment, management systems and surveillance and monitoring.

In the past year the Safety Requirements document has been approved by the Waste Safety Standards Committee (WASSC) and the Safety Standards Commission (CSS) and significant progress has been made on the supporting guide documents; with the guidance on geological disposal also having been approved by WASSC. The outstanding guides are those on near surface disposal, mining waste disposal, the safety case and monitoring and surveillance.

The new Safety Requirements combined former standards on near surface and geological disposal making use of the latter quite recent standard as a model for the structure of the document. This development has required the similarities and differences between near surface and deeper disposal to be highlighted and caused considerable international debate on a number of issues in particular the status of a near surface facility in the longer term, that is beyond the envisaged period of operation, a few decades and beyond the envisaged period of institutional control, a few centuries.

International consensus was reached on this rather complex issue and it is believed the document will be of considerable assistance in the future licensing decisions on both the operation and closure of such facilities. For all disposal types the emphasis given to the “safety case“ concept has also evolved and again international consensus is emerging on this matter, which should again assist the licensing process commencing in a number of countries in respect of geological disposal.

The new Safety Requirement sets down the safety objective; *to site, design, construct, operate and close a disposal facility so that protection after its closure is optimized, social and economic factors being taken into account. A reasonable assurance also has to be provided that doses and risks to members of the public in the long term will not exceed the dose constraints or risk constraints that were used as design criteria.* It provides safety criteria for the post closure period for the normal evolution of the facility and for possible disruptive events, both naturally induced and those caused by humans.

The actual requirements are presented in three sections covering; planning for disposal facilities, the development operation and closure of facilities, assurance of safety and existing facilities. The section on planning addresses the governmental, legal and regulatory framework, the safety approach to be adopted i.e. the importance of safety in decisions on facility development, the need for passive safety features and the need to understand the phenomena affecting safety, and the design concepts to be adopted i.e. multiple safety functions, containment, isolation and assurance of the passive safety functions.

The requirements for development , operation and closure of facilities covers the need for step by step development of facilities, the safety case and all the steps in the development of the facility e.g. site characterization, design, operation etc. The section on assurance of safety covers waste acceptance criteria, institutional control, safeguards, security and management systems. The final section deals with existing facilities developed prior to current standards being in place.

The presentation will provide a background to the disposal standards, discuss the safety criteria for post closure and then discuss the various requirements related to each of these sections. The newer aspects introduced into the document will be highlighted, in particular those related to the post closure phase of near surface disposal facilities and the issues of human intrusion and institutional control. There are three discrete requirements dealing with the safety case and supporting assessment and these will also be discussed. The safety guide on the safety case and supporting assessment currently under development will be summarized and discussed.