

robustness of the whole waste management process. An optimal solution means addressing safety requirements whilst balancing other factors such as the need to use resources efficiently, political and acceptance issues and any other boundary conditions imposed by society. It was noted that optimisation variables are not well defined and could be quite programme-specific.

However, the discussion showed a lot of agreement and consensus of views. In particular, the summary noted general agreement on the following points:

- Optimisation is a process that can be checked and reviewed and needs to be transparent. Optimisation is therefore a learning process, and as such can contribute to building confidence in the safety case by the demonstration of ongoing learning across the organisation.
- Optimisation occurs at each stage of the disposal facility development programme, and is therefore forward looking rather than focussed on re-examining past decisions. Optimisation should be about the right way forward at each stage, making the best decisions to move forward from the present situation based on current knowledge and understanding.
- Regulators need to be clear about their requirements and these requirements become constraints on the optimisation process, together with any societal constraints that may be applied in certain programmes. Optimisation therefore requires a permanent dialogue between regulator and implementer.
- Once the safety objectives (dose/risk targets and other constraints) have been met, further optimisation should be aimed at moving the project forward as efficiently as possible, and this could largely be reflected as cost optimisation.

## **ONR Licensing & Regulation of a Geological Disposal Facility in the UK – F. Boydon and**

### **D. Glazbrook (UK-ONR)**

The UK has substantial quantities of waste which has arisen from operation and decommissioning of legacy nuclear plant. While a disposal route for Low Level Waste (LLW) has been in operation in the UK for many years, there is as yet no such route for Higher Activity Waste.

The government invited local communities to express an interest in hosting a Geological Disposal Facility (GDF). However, the Scottish government is opposed to deep disposal and proposes long-term interim storage in Scotland.

This paper describes the work underway and current progress in developing a GDF for the UK. In particular it describes the current legal system in the UK that enables nuclear facilities to be licensed and the background underpinning licensing of existing disposal facilities. It identifies changes which will be necessary to legislation to enable a GDF to be licensed and work which it is performing in close co-operation with the Environment Agency which operate a permitting regime for environmental aspects.

The Office of Nuclear Regulation (ONR) regulates safety, security and transport associated with nuclear sites. This paper focuses on the regulation of safety and radioactive waste.

The UK licensing regime is non-prescriptive and proportionate, allowing for a flexible approach to licensing. The licence is not time-limited but is designed to be used from construction, through commissioning for the lifetime of the facility.

Under the Nuclear Installations Act 1965 (as amended) ONR may attach licence conditions:

- In the interests of safety; or
- with respect to the handling, treatment and disposal of nuclear matter.

ONR has developed a suite of 36 Licence conditions, which typically require the operator to make 'adequate arrangements' to ensure safety. These arrangements would involve the use of 'hold points' beyond which the operator must not proceed without ONR's agreement. In determining whether to agree to progression beyond a hold point, ONR would be legally obliged to consult the Environment Agency to ensure a consistent approach between the two regulators. The arrangements also allow the design of the GDF to progress in a phased manner and for any changes that are made to be under regulatory control.

## **Session Report – P. Zuidema (Nagra)**

### ***Some general observations***

Licensing is one of the most important steps in implementing geological repositories for radioactive waste. There are large differences between the different countries in the number and the level of the licences to be granted in the stepwise approach of repository implementation, ranging from one licence (combined with several regulatory permissions) to a number of licences, with decisions taken for all of them at a high (sometimes even at the highest political) level. In some countries the licences are granted by the regulator / commissioners, in other countries it is a decision by the government that needs to be confirmed by parliament and/or by a public referendum. This also reflects the differences in the societal and political framework in the different countries.

The prerequisites for licensing, however, are on a general level similar. To grant a licence, the project must have been developed to a sufficient level (including optimisation). This implies that for the next step, a high level of confidence is available, whereas for the steps further away not everything needs to be fully developed yet, although the path forward must be adequately defined. This approach is combined with the possibility to make adaptations taking into account future developments, based on a clearly defined (organisational) approach. Thus, it may be appropriate in a licence application to choose a design that allows for modifications and to mention alternatives in the licence application that may be implemented at a later stage (see e.g. SKB's licence application where in addition to the reference concept KBS3-V, the KBS3-H concept has also been proposed as an alternative that may be used at a later stage). This also means that sufficient flexibility should be maintained when granting a licence to accommodate possible future needs and developments should they turn out to be necessary. Thus, it is important to envisage in the licensing process that there may be differences between the design conceived in the licence and the actually implemented design. In broad terms, the licence forms the framework for the further development of the project by the licence holder in consultation with the supervisory authorities (e.g. where the supervisory authorities express agreement through