



ENVIRONMENTAL IMPACT ASSESSMENTS AND GEOLOGICAL REPOSITORIES - A MODEL PROCESS

S. WEBSTER

European Commission, Environment Directorate-General

Abstract

In a recent study carried out for the European Commission, the scope and application of environmental impact assessment (EIA) legislation and current EIA practice in European Union Member States and applicant countries of Central and Eastern Europe was investigated, specifically in relation to the geological disposal of radioactive waste. This paper reports the study's investigations into a model approach to EIA in the context of geological repositories, including the role of the assessment in the overall decision processes and public involvement.

1. INTRODUCTION

European Community Directive 85/337/EEC [1] has made environmental impact assessment (EIA) a mandatory requirement in all European Union (EU) Member States for a wide range of projects having potential impact on the environment. This includes installations "*solely designed for the permanent storage or the final disposal of radioactive waste*". Under the amending Directive 97/11/EC [2] this requirement is extended to "*installations designed ... solely for the storage (planned for more than 10 years) of ... radioactive waste in a different site than the production site.*"

In the context of the development of a geological repository, a recently completed study carried out for the Environment Directorate General of the European Commission examined the following aspects:

- National requirements for EIAs (EU Member States, EU applicant countries, Canada, Switzerland, USA), implementation of Directive 85/337/EEC and its amendment in the EU Member States, progress towards adoption of equivalent legislation in the EU applicant countries;
- scope and contents of EIA reports;
- an idealised (model) EIA process;
- the involvement of the public in the EIA process; and
- how the EIA would be affected by introducing measures to increase waste retrievability.

Information was obtained from a variety of governmental, national and other sources in the countries concerned principally by questionnaire. The reader is referred to the final report [3] for the full details and results of this study. This paper presents the study's discussions and conclusions regarding the idealised EIA process and the related issue of public participation.

2. MODEL PROCESS FOR EIA OF GEOLOGICAL REPOSITORIES

The life-span of a project involving a geological repository for radioactive waste will necessarily consist of a number of discrete steps, with formal consents normally being required from national authorities before moving from one major phase to the next. These major phases are likely to be site selection, construction of the facility, commencement of waste emplacement, closure of the facility

and termination of institutional control of the site. However, from the point of view of the EIA process, the major decision milestone is the point at which the developer seeks consent to proceed with development of the facility. In the European Community Directive, this development consent is defined as the granting of permission to proceed with “*the execution of construction works or of other installations or schemes*” or that part of the project involving “*interventions in the natural surroundings and landscape*” (Article 1). Under Article 8 of the Directive, the national body responsible for deciding whether development consent is granted for a project (the competent authority) must take account of:

- the information in the EIA Report (see [3] for a detailed discussion of the report contents); and
- the results of the necessary consultations with the public and other relevant authorities (including in other Member States where appropriate).

Therefore the EIA process, which culminates in the preparation of an EIA report, relates principally to the pre-development phase, though it is implicit that national authorities should ensure that measures proposed to mitigate environmental impacts are actually implemented in practice. Though the EIA report can be regarded as just one of many submissions from the proponent to the competent authority, the study report [3] recommends that it is used to draw together all the main arguments advanced by the proponent for seeking to proceed with a particular project. A proposed model EIA process for this pre-development phase is depicted schematically in Fig. 1. The phase will generally be organised into the following stages:

- concept and planning;
- national and area survey;
- *site characterisation; and*
- site confirmation.

The actual process of identifying potential disposal sites could follow an approach based on general screening using pre-established technical and other criteria, or one based on volunteerism by local communities, or on a combination of the two. However, it is suggested that the application for development consent should be made following the selection of a preferred site, i.e. at the end of the site characterisation phase. Consent granted at this stage by the competent authority would normally be made subject to the satisfactory completion of underground testing during the site confirmation phase. Nuclear safety legislation in most EU Member States would require a further formal consent by regulatory authorities before the developer could begin construction of major components of the facility.

Prior to the adoption of the amending Directive in 1997, the developer was only required to provide information about alternatives considered “*where appropriate*”. This caveat was removed from 97/11/EC, Article 5(3) simply stating that the information provided by the developer should include “... *an outline of the main alternatives studied by the developer and an indication of the main reasons for his choice, taking account of the environmental effects*”. This would appear to emphasise the role of EIA in the site selection process, in practice making it obligatory for a developer to study alternative options to that being proposed, unless there clearly are none. Therefore, although there is no explicit requirement in EU legislation for the EIA process to be integrated closely into the process of site selection and project development, the requirements of Article 5(3) make this unavoidable. As a result, the EIA Report should incorporate information on the assessed performance of the preferred site together with comparative information for alternative sites.

In principle, the requirement that a developer provide details about main alternatives studied applies both to the proposed waste management process as well as the choice of a particular disposal site. Consideration of alternative waste management options could take place in connection with an

application for development consent at a specific site, or could largely be addressed in advance of site selection via a strategic environmental assessment (SEA) of waste management options. Although such a process of early strategic evaluations is outside the scope of the Directive (being the subject of a draft SEA Directive [4], "Plans and Programmes"), it does provide a convenient mechanism for discussion of issues of principle in advance of considerations about a specific project.

3. PUBLIC PARTICIPATION

Lack of consultation and public involvement can mean that people affected by a project are either unaware of the proposal or feel their needs or concerns are not taken into account. In turn, this makes it more likely that implementation will be impeded by opposition and protest. It is therefore in the developer's own interest to ensure that issues of public consultation and participation are adequately addressed. Ultimately, the objective is to develop a project that not only is technically sound but that also commands broad public understanding and support.

The nature of public involvement in decision-making relating to the development of a geological repository will differ according to the precise stage of the project itself. Public participation in the model EIA process is indicated in Fig. 1. It is suggested that, in the early phases (before potential repository sites are identified), decisions of a strategic nature are required at national level, e.g. relating to overall waste management policy. During the siting process the focus of involvement will move towards those regions that appear to meet the basic siting criteria, and finally to local communities as this focus narrows to specific potential sites. However, though the type of involvement will vary as the project progresses, fundamental principles applying to all public involvement require participation to be:

- inclusive, transparent and honest;
- interactive – a two-way process including feedback; and
- started early and occur throughout the process (with defined cycles of activity).

At the outset, since the objective of any programme of public participation is to achieve a certain level of public awareness, the level of existing awareness must first be determined by market research techniques. It is also important to develop an understanding of the key social characteristics of the community concerned (which may be at a national, regional or local level). Other key initial requirements are the definition of the overall objectives of the public involvement programme and an outline of the principal public activities at each phase of the assessment process. The programme will need to cater for easy access by any interested individuals and must be seen as being fair, i.e. the public must be able to contribute to defining the scope and nature of the programme itself. In this regard, the process of public participation may be enhanced by:

- Open Houses;
- Planning Workshops;
- Community Advisory Committees;
- Citizens' Juries and Consensus Conferences;
- Participative Social Impact Assessment and Management.

The study report [3] provides a full description of these processes. It is important that mechanisms are put in place to ensure that queries raised by members of the public are considered by proponents, with visibility of how queries are addressed, e.g. though providing access to relevant correspondence. Public involvement will be encouraged if people believe they can influence the decision-making process.

4. SUMMARY

This paper presents a model approach to EIA of facilities for geological disposal of radioactive waste. The objective is to illustrate “best practice”, enabling consideration of the potential for, and/or benefits of, greater harmonisation of approaches in different countries. It is widely recognised that EIA can be used as a vehicle for effective communication with the public, and the role and value of public involvement in this model process are also considered in this paper.

The Commission service for nuclear safety in the Environment Directorate General is considering the results of this study and the associated workshop held in Brussels on 20 - 21 April 1999 (see also study report [3]), and is keen to pursue a policy that reinforces the role of the EIA process in repository development.

References

- [1] http://www.europa.eu.int/eur-lex/en/lif/dat/1985/en_385L0337.html
- [2] http://www.europa.eu.int/eur-lex/en/lif/dat/1997/en_397L0011.html
- [3] Environmental Impact Assessments and Geological Repositories for Radioactive Waste; European Commission DG-ENV; Report EUR19152; October 1999
(also refer to <http://www.europa.eu.int/comm/dg11/pubs/nuclear.htm>)
Report authors: P. O'Sullivan, B. McKirdy, M. Askarieh (UK Nirex Ltd) A. Bond, S. Russell*, S. Dagg, I. Russell (The University of Wales, Aberystwyth, UK) J. Alonso, J.L. Santiago (ENRESA, Spain) *now at Imperial College, University of London
- [4] <http://europa.eu.int/comm/dg11/eia/sea-legalcontext.htm>

Stages	Pre-EIA process	Concept and Planning	National and Area Survey	Site Characterisation	Site Confirmation	
Main Activities	Establish Government Policy	<ul style="list-style-type: none"> • Generic disposal/storage concept • Plan for siting process 	<ul style="list-style-type: none"> • Identification of : <ol style="list-style-type: none"> a. areas for potential sites; b. potential sites 	<ul style="list-style-type: none"> • Surface-based investigations at potential sites • Determination of application by competent authority 	<ul style="list-style-type: none"> • Underground investigations 	
EIA Process		<p>Development and strategic appraisal of:</p> <ul style="list-style-type: none"> • Generic disposal/storage concept • Plan for siting process • Screening guidelines and site evaluation strategy 	<ul style="list-style-type: none"> • Assessment of potential locations against technical and social siting criteria • EIA process in relation to drilling of boreholes at the identified potential sites (where applicable) 	<ul style="list-style-type: none"> • Site specific and design specific environmental and social assessments • Evaluation of alternatives and selection of preferred site for development • EIA report prepared for competent authority 	<ul style="list-style-type: none"> • Preparation of detailed performance assessment • Monitoring of compliance with conditions of development consent 	
Public Participation	<ul style="list-style-type: none"> • Consultation by Government on radioactive waste management policy • Develop public education programme (where appropriate) 	<ul style="list-style-type: none"> • Undertake social profile and stakeholder analysis • Develop public involvement programme • Measure public support for specific proposals 	<ul style="list-style-type: none"> • Prepare area and community social profiles • Develop mechanisms for interaction with interested communities • Implement public involvement programme (at regional and local levels) 	<p>Ongoing implementation of public involvement programme, including:</p> <ul style="list-style-type: none"> • Consultation on programme for EIA process ('scoping') • Evaluation of environmental and social impacts • Consultation on EIA report 	<ul style="list-style-type: none"> • Continuing interaction with local community about development of final design and mitigation of environmental impacts • Feedback results of ongoing investigations to local community and to interested groups at regional and national level 	
Formal Decision Points		Endorsement of plan for siting process by relevant authority		Development consent for boreholes by competent authority	Development consent for project by competent authority	Consent for construction by regulatory authorities

Figure 1. The EIA Process for a geological repository or long-term storage facility