How a regulator is preparing for reviewing a license application file: The case of ASN

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French context

ASN

The French Nuclear Safety Authority (ASN) is an independent administrative authority. It prepares regulation pertaining to the management of radioactive waste, monitors the control of safety of basic nuclear installations that produce or treat waste or are involved in their disposal and performs inspections of waste producers (EDF, AREVA, CEA, hospitals, research centres, etc.) and Andra, the French National Radioactive Waste Management Agency. It regulates the overall system set up by Andra for accepting waste from producers and assesses waste management policy and the practices of radioactive waste producers. It reviews license applications and authorises commissioning of nuclear installations.

In order to review technical documents, ASN benefits from the expertise of technical support organisations. The French Institute for Radiation Protection and Nuclear Safety (IRSN) is the main such organisation. ASN has been making efforts to diversify its experts for several years.

In preparing its decisions, ASN also calls on the opinions and recommendations of seven Advisory Committees of Experts (GPE), with expert knowledge in the areas of waste, nuclear pressure equipment, medical exposure, non-medical radiation protection, reactors, transport, and laboratories and nuclear plants. ASN consults the GPEs in preparing its main decisions. In particular, they review the preliminary, provisional and final safety analysis reports for each nuclear installation. They can also be consulted about changes in regulations or doctrine.

Regulatory framework with regard to deep geological disposal

Researches and studies related to the deep geological repository are performed in the framework of French law.

Firstly, the Act of 30 December 1991 related to research on management of radioactive waste defined three different axes of research on management of high-level radioactive waste: separation and transmutation, deep geological repository (both reversible and irreversible) and long-term storage. Andra was in charge of research on deep geological repository.

In order to perform this research, Andra was authorised, in 1999, to operate an underground laboratory at the border between the Meuse *département* and Haute-Marne *département* in Bure.

Some milestones were defined and Andra submitted files at each step with a presentation of the work carried out.

In 2005, Andra submitted the "Dossier Clay-2005" that was reviewed by ASN with the support of its technical support, IRSN and of the advisory committee in charge of waste. ASN issued a stance on this work on 1 February 2006.

The Act of 28 June 2006 on sustainable management of radioactive materials and waste defined a reversible deep geological repository as the reference solution for management of radioactive waste that cannot be disposed of in surface or near-surface repositories. Andra is in charge of designing, sitting, operating, decommissioning and monitoring this deep geological repository. The law defines a schedule for the commissioning of this disposal facility: an application file for creation authorisation must be reviewed in 2015 and according to the result of the authorisation process, this disposal facility should be commissioned in 2025.

This "Waste Act" also determined that a national plan for radioactive materials and waste management (called PNGMDR) shall be produced and updated every three years. The purpose of the PNGMDR is to review the existing management procedures for radioactive materials and waste, to identify the foreseeable needs for storage and disposal facilities, to clarify the necessary capacity of these facilities and the storage durations and, for radioactive waste for which there is as yet no final management solution, to determine the objectives to be met. The main provisions of the plan and the studies required by the PNGMDR are set by a ministerial decree.

This plan is co-directed by ASN and the Ministry of Energy.

This plan is used as a steering document for the different steps of designing and sitting a deep geological repository.

Safety guide

In 2008, ASN issued a safety guide related to disposal of radioactive waste in a deep geological repository.

This guide defines objectives that have to be met from the early investigation phase for siting and conception of a repository in order to ensure long-term safety after closure of the installations.

This guide is a way to frame works performed by Andra.

The guide, resulting from a working group of experts organised by ASN, was issued after comments of the advisory committee on waste management.

How ASN prepares for reviewing the license application

Staff

ASN does not have a full team dedicated to the deep geological repository, but has recruited a project manager to create a link between all the subjects and entities involved in the project (regulatory, fire specialists, communication, etc.). This project manager dedicates part of his/her time to participate in international working groups or conferences in order to enlarge his/her view of the subject.

Moreover, ASN has to maintain and improve the balance of expertise and experience of its advisory committees, particularly the one dedicated to waste that will be the most implicated in the review of the license application.

With this objective, ASN organises with the support of IRSN dedicated meetings for its advisory committee in order to provide it with generic technical or scientific information

related to deep geological repository and to present the latest work from Andra that is not directly submitted to its recommendation (only main decisions require advice from advisory committees).

These meetings enable it to follow Andra's work and to receive information it should require during document review. The advisory committee can also directly exchange with international peers (e.g. yearly meetings with German peers) or by presentation of work carried out in international projects (e.g. presentation last spring of works performed in the PRISM project).

IRSN also recruits and trains its own staff in order to prepare itself for reviewing the application file. Moreover, IRSN carried out research in order to check data presented by Andra and to improve the competence and experience of its own staff.

Reviewing early files

Within the framework of PNGMDR, Andra and waste producers can be asked to carry out studies and issue associated technical documents. Several studies are thus requested every three years (period covered by a version of the PNGMDR).Then, for each of them, the stance of the ASN can be required by the Ministry of Energy.

In addition, Andra can also submit documents to ASN, for instance defining options it is considering for the design, site, operation and monitoring of a disposal facility. ASN can decide to issue an opinion on these documents.

Since 2006, ASN issued five main opinions on documents issued by Andra:

- In 2006, on the results of studies on the three axes of research defined by the "Waste Act" of 1991 (separation and transmutation, long-term storage, deep geological repository). In this opinion, the ASN defined deep geological repository as an essential solution for management of high level waste.
- In 2010, on a proposition from Andra on a specific area for further research (ZIRA) in view of siting of a deep geological repository (as requested by the PNGMDR).
- In 2011 on the dossier "Jalon 2009" issued by Andra on extension of operation in the Bure underground research laboratory.
- In 2013 on a proposition of inventory, seismic investigation results and research related to disposal of spent fuel and answers from Andra on a study performed by an independent organism (IEER) by request of a local committee implicated in Andra's work.

Each of these opinions was an opportunity for ASN to:

- evaluate the quality of the work carried out by Andra;
- request further studies on specific points;
- define elements that have to be developed for the license application file;
- define principles according to which license application will be reviewed.

For instance, in its latest opinion ASN required Andra to consider a specific scenario in its safety case, asked Andra to generalise the use of both determinist and probabilistic approaches and provided Andra with principles that have to be followed in order to establish the waste inventory in view of the license application file.

Regulatory aspects

A deep geological repository is a specific nuclear installation, given the fact that part of it is underground and that it is intended to be operated for more than 100 years.

Moreover, the principle of reversibility and retrievability introduces new needs during application file reviewing.

In consequence, the licensing of such a facility will require a specific procedure.

In France, the "Waste Act" of 2006 introduces news steps in the authorisation procedures: a public debate (which was held between March and December 2013), specific consultation of local communities, the need for a law defining the conditions of reversibility of the facility – a law that must have been voted by the French parliament before authorisation could be granted,...

The implementation of these principles must be explained in a ministerial decree. ASN and the Ministry of Environment are currently working on that document.

In addition, exchanges between ASN and Andra are required, so that ASN can define the content required for the application file.

However, regulatory aspects are not limited to the authorisation process of the facility. The whole lifetime of the installation requires specific arrangements: modification of authorisation (e.g. in case of evolution of the inventory for instance to allow disposal of spent fuel), follow-up of reversibility, backfilling, sealing or closure of parts of the repository, final closure (in France this would require a specific law) and oversight.

All these aspects must be studied before the authorisation so as to share information with the public, and also due to their impact on the content of the application file.

Andra R&D programme

In 2011, Andra was authorised to pursue operations of its underground research laboratory.

This authorisation was approved after an opinion was issued by ASN.

ASN considered that the programme of R&D submitted by Andra was likely to enable it to gather the input data requested for filing its application file.

During regular inspections, ASN checks that the research carried out by Andra is consistent with its programme of R&D and is performed under good conditions.

International works

In order to prepare for the review of Andra's license application file, ASN also relies on international works in different ways:

- to define principles (for instance on reversibility);
- to define a regulatory framework (for instance within WENRA);
- to improve its technical and scientific background;
- to exchange information with other regulators (in bilateral or multilateral meetings)