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Recent approaches for stakeholder involvement

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2 Foreword

The objective of the FP7 program SITEX project coordinated by IRSN is to set up a network capable of harmonizing European approaches to technical expertise in geological repositories for radioactive waste. Lasting 24 months, SITEX brings together 15 organisations representing technical safety organisations (TSOs) and safety authorities, as well as civil society outreach specialists.
SITEX plans to help establishing the conditions required for developing a sustainable network of technical safety experts who have their own skills and analytical tools, independently of the operators, and who are capable of conducting their own research programs in coordination with research activities performed by operators. It is expected that this network will able to provide technical support for regulators within corresponding decision making and licensing processes. Stakeholders involved in these processes could be another target group for expertises independent from the implementer of geological repositories. This type of support is an issue solved by the WP 5 of SITEX.

3 Summary

This compilation study compares and analyses documents – outputs from other relevant projects on the stakeholders involvement in decision making and development of geological disposal, activities of the Forum on Stakeholders Confidence established under the NEA OECD, relevant activities of the Aarhus Convention Nuclear association and national experiences and practices.
Various processes of interaction between experts and civil society have thus developed in Europe since the mid-1990's, involving different types of experts: institutional experts (TSOs), civil society experts, independent experts (university, foreign experts not engaged in the national context…).
The objective of the case studies developed in this document was

- to investigate practical implementation of interactions between experts, in particular TSOs, and stakeholders in Europe in the last 15 years by analysing concrete cases ;
- and to draw general lessons about the conditions and means of interactions between experts and civil society in the field of radioactive waste management (RWM).

The considered case studies relate to various processes involving interactions between experts in the nuclear field and civil society actors at the local, national and supranational level. They are mainly situated in the field of RWM but also include cases related to innovative processes of interaction in other fields of nuclear activities.

4 Introduction

The project SITEX aims to identify the efficient means that should be developed through the establishment of a sustainable expertise function network within a European framework with the view to:

- allow mutual understanding between regulatory bodies, TSOs and waste management organizations (WMOs) on (i) the regulatory expectations at decision hold points and (ii) how the scientific and technical elements carried out by the WMOs comply with these expectations.
- in coordination with or in complement to WMO's research program, define an optimal scheme for TSO's R&D program that would ensure independent capabilities development for reviewing the Safety Case and assessing the scientific arguments provided by WMOs.
- ensure competence building of experts in charge of technical review and transfer of knowledge on waste safety and radiation protection, the needs in guidance development for harmonizing the technical review activities and in dedicated training and tutoring for spreading the expertise culture and practices.

WPs of the SITEX are predominantly oriented to enlarge the expertise within the geological disposal safety (licensing) documentation reviewing processes, i.e. by establishing a network of competent and independent organizations providing the technical support for regulatory authorities.
The focus and position of the WP 5 within the project SITEX is slightly different. Its objective is to propose arrangements for interacting with stakeholders (general public) in the process of technical expertise and sharing, where needed, expertise approach with various stakeholders, in a manner more integrated than when only communication or dissemination is envisaged (e.g. by sharing expertise activity with volunteers). A specific aspect is to learn about the possibilities of the future expertise network to contribute in developing stakeholder's technical capabilities for ensuring this valuable and constructive interaction.
The following organizations are participating in this WP 5:

- DECOM a.s., Slovakia (WP leader);
- Institut de radioprotection et de Sûreté Nucléaire, IRSN, France;
- Federal Agency for nuclear Control, FANC, Belgium;
- Ustav Jaderneho Vyzkumu Rez a.s., UJV, Czech Republic;
- Ministerie Van economische Zaken, Landbouw en Innovatie , ELI, Netherlands;
- MUTADIS Consultants SARL, France;
- Nuclear Research and Consultancy Group, NRG, Netherlands.

The objective of the document/deliverable D 5.1 is to compile and analyze information on recent activities related to the stakeholders involvement in the geological disposal decision making and development activities and formulate the expectations from and approaches to

an action plan on the development of stakeholder's technical capabilities in order to be able to play a role in the decision making process, which is a main objective of the WP 5.
Since the 1990s, in the field of hazardous activities in general and in the nuclear field in particular, a general trend of evolution has developed in Europe towards reinforced information and participation of the public to decision-making processes and towards more inclusive governance frameworks.
At an international level, this trend has notably led to the signature in 1998 of the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters by the European Commission and 39 European and Eurasian countries including the EU Member States (see below – at the chapter 5.2).
At the European level, the provisions of the Aarhus convention for information and participation of the public have been incorporated to several European directives related to regulation of radioactive waste management or, more generally, of activities with potential impact on the environment. These directives notably include:

- The European Directive on the assessment of the effects of certain public and private projects on the environment (Environmental Impact Assessment – EIA – Directive). The original directive was issued in 1985 (Directive 85/337/EEC) and was amended in 1997, 2003 and 2009. The 2003 amendment aimed to align the provisions on public participation with the Aarhus Convention. The initial Directive of 1985 and its three amendments have been codified by DIRECTIVE 2011/92/EU of 13th December 2011.
- The European Directive 2001/42/EC of 27th June 2001 on the assessment of the effects of certain plans and programmes on the environment (Strategic Environmental Assessment – SEA – Directive).
- The Directive 2011/70/EURATOM of 19th July 2011, establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste (articles 10(1), 10(2) and 12(1)).

5 Overview of activities and outputs of the Forum on Stakeholders Confidence, Aarhus Convention Nuclear association and other international initiatives

5.1 NEA OECD FORUM ON STAKEHOLDER CONFIDENCE

The NEA OECD Forum on Stakeholders Confidence (FSC) can be judged today as the most fruitful initiative dealing with stakeholders' involvement in area of implementation of radioactive waste disposal. It was established 12 years ago by the NEA OECD Radioactive

Waste Management Committee (RWMC) [1]. RWMC pinpointed the understanding of factors influencing public perception and confidence in the area of radioactive waste management as its strategic interest. At the broader level, strengthening of public participation, transparency, accountability and policy effectiveness in Member countries became major areas of the work of the OECD.

Originally, the FSC mandate covered a period of three years. The FSC acted, on behalf of the RWMC, as the centre for informed exchanges of opinions and experiences across institutional and non-institutional boundaries, and distilled the lessons that can be learnt. It composed of nominees from NEA Member countries with responsibility, overview, and/or experience in the field of stakeholder interaction and confidence.

Over its mandate, the FSC was expected to create:

- an atmosphere of trust where information can be exchanged and experiences can be discussed; as well as
- a working environment conducive to tangible results and culminating later with the drafting of a widely agreed upon document (-s) on the principles, implications, and practice of technical and non-technical stakeholder involvement in waste-management projects.

For fulfilling these expectations, the FSC formulated the following priorities of its work:

- to identify specific issues of interest on which stakeholders can learn from one another;
- to distil in a concise form the lessons learnt and provide a fund of information accessible to policy makers and other interested parties in the NEA Member countries. Specific tools that contribute to effective interactions should also be considered and developed.

Regular FSC meetings represented one type of the FSC activities. Generally, the meetings had their standard contents:

- exchange of information on stakeholder involvement and interactions in NEA Member countries,
- strategic discussion and topical sessions conducted with experts and specific groups of stakeholders' representatives,
- establishing the subgroups with defined mandate to carry out specific studies for later submission and approval by the FSC,
- definition of the strategic programme of the next workshop,
- discussion on outputs of workshops and subgroups.

For achieving the above-mentioned strategic goals, it was decided to alternate regular FSC meetings with workshops held in national contexts at which the additional representation of civil society should be featured prominently. These workshops should serve as a neutral ground for discussion, dialogue, and advancement of knowledge. The workshops represented an opportunity to:

- view the inner workings of waste-management programs, the methods they had employed for stakeholder interactions, the successes and failures, and hear directly from involved stakeholders their own views about the methods by which they were involved in the decision-making,
- create interactions between the local stakeholders and participants from other countries,
- deal with specific topics in depth, taking advantage of the participation of a wide range of expertise and representation beyond the traditional technical specialists,
- discuss the specific assessment or documentation prepared by FSC with interested stakeholders before release.

The first workshop took place in August 2000.

One of the first FSC's tasks was to determine thematic scope of issues which should be discussed at the meetings. The first round of questions resulted from the particular questionnaire, the opinions from the first workshop and individual contributions. Issues were divided into three groups:

A. Processes and structures

- The role of Environmental Impact Assessment for the decision making processes.
- Possibility of the stakeholder interaction analysis to determination of stages at which trust is particularly important and the development a set of good practices.
- Integration of a waste management programme into a regional development plan.
- Role and input of science/technology in the decision making for long-term waste management.
- Institutional covering of the safe management of radioactive waste on the scales of 100-300 years.
- Possibilities to apply the complex waste management decision making processes, on the conditions of radically different views between parties, in other areas involving similar issues of governance and management.

B. Organizational issues, trust

- "Good" organizational behaviour and culture for building the trust.
- Characteristics of a "good" institutional framework. Roles and organisational characteristics of the various players, including constrains imposed.
- What is entailed by "stretching" organisations and how is this accomplished?
- Integration of information obtained from dialogues with stakeholders into organisational outlook and operations.
- Achieving and maintaining the trust, the role of communication for trust building.
- Necessity and usefulness of separation such concepts as "acceptance", "values" and "trust" within the discussion.

C. Stakeholder involvement

- Definition of stakeholders and their role in decision making and in implementing decision.
- Mechanisms of dialogue with the different stakeholders. Ways of consulting and involving a broader segment of stakeholders early in the programme when the policy is being defined.
- How can people be convinced to co-operate in a long-term solution to the waste-management issue, independently of their view on the future of nuclear energy?
- Addressing issues such as retrievability and reversibility. Can keeping available the more alternatives/options to final disposal positively influence a degree of public confidence?
- Development of guidelines for improving dialogue on key issues.
- Methods of the objective public interaction evaluation.
- Determination of the information set needed for local decision makers.

5.1.1 National workshops

After the inauguration and first workshop meeting ("Stakeholder Confidence and Radioactive Waste Disposal") held in Paris, August 2000 [3], eight national workshops and community visits were organized during more than 10 years of the FSC history [2]:

- "Stepwise Decision Making in Finland for the Disposal of Spent Nuclear Fuel". **Turku, Finland, November 2001** [4]. Presentations and consequent round table discussions were held in five sections:
  - Finish Decision in Principle and its background;
  - Process of stepwise decision-making in Finland;
  - Stakeholder involvement, particularly within the EIA;
  - What gives confidence to the various categories of stakeholders?
  - Conclusion, assessment and feedback.
- "Public Confidence in the Management of Radioactive Waste: The Canadian Context". **Ottawa, Canada, October 2002** [5]. Besides the description of Canadian policy and the regulatory environment for radioactive waste management, two central case studies was discussed at the workshop: the Port Hope Area Initiative (including the site visit) and the new Canadian Nuclear Fuel Waste Act. Three sessions addressed the topics "What are the social concerns?", "How to address social concerns?"and "Development opportunities for communities". Each of the sessions began with plenary presentations by five stakeholders followed by round-table discussions.
- "Dealing with Interests, Values and Knowledge in Managing Risk". **Brussels, Belgium, November 2003** [6]. Three local partnerships were visited during the workshop: Fleurus-Farciennes (site of the planned disposal facility), Mol and Dessel. Issues presented and discussed in the three sessions were: "Dealing with

interests and values in managing risk", "Dealing with knowledge in managing risk" and "Building a relationship to a concrete waste management project".

- "Disposal of Radioactive Waste: Forming a New Approach in Germany". **Hitzacker and Hamburg, Germany, October 2004** [7]. The workshop started with briefing of the FSC and other workshop participants, followed by meeting with the stakeholders from Gorleben and Konrad areas. Three sessions took place at the workshop and addressed the topics "The new proposed approach to site selection, with emphasis on basic premises", "The new proposed approach to site selection, with emphasis on stakeholder involvement", and "The new approach to responsibilities and cooperation with emphasis on policy aspects". Each of the sessions started with short plenary presentations by representatives of various stakeholders' interests and focusing on a pre-defined set of questions. Participants were then divided into roundtable discussion groups that examined similar questions. Outcomes of each roundtable discussion were reported in follow-up plenaries.
- "Radioactive Waste Management in Spain: Co-ordination and Projects". **L'Hospitalet de l'Infant, Catalonia, Spain, November 2005** [8]. Visit to the site Vandellos-1 (under decommissioning/dismantling) and its municipality was a part of the workshop. After that, the three main themes of the "COWAM Spain" initiative and corresponding project in regard of implementation national storage facility for spent fuel and high level waste were presented and discussed: democracy and participatory systems for the local level; the interplay between the national and local level; and the long-term governance.
- "Regional Development and Community Support for Radioactive Waste Management", **Tengelic and Bataapati, Hungary, November 2006** [9]. After description of Hungarian system of radioactive waste management and presentations on decision-making and sociological aspects of this area, participants visited the Bataapati site and met there the municipality leaders. The workshop continued in following sessions:
  - Implementing the development plan in step with facility development;
  - A facility as the trigger of a local/regional development plan;
  - Building a sustainable facility.

  As a part of the workshop, three FSC thematic reports were presented and discussed: on co-operation and competition in regional economic development associated with radioactive waste management, on local voice and benefit in the implementation of radioactive waste management policy, on building a sustainable relationship through added cultural and amenity value.
- "Radioactive Waste Repositories and Host Regions: Envisaging the Future Together", **Bar-le-Duc, France, April 2009 [**10]. After opening statements and

presentations in French historical and national context, the programme consisted of three sessions:

- Local public information;
- Reversibility: expectations and motivations;
- Environmental monitoring and the issue of memory.

Visit on the underground laboratory and the technological centre nearby was also a part of the workshop.

- "Actual Implementation of a Spent Nuclear Fuel Repository: Seizing Opportunities", **Östhammar, Sweden, May 2011** [11]. After opening session, the program consisted of next five ones. In the first two, organizers provided a picture on visions of Oskarshamn and Östhammar municipalities and on the Swedish nuclear waste management programme. Next sessions dealt with:
  - Dialogue with local communities, information exchange and transparency in the new phase of Swedish deep repository development;
  - EIA as a tool for achieving deep consultation;
  - The added value programme and local economic development.

  Participants had also an opportunity to visit the Östhammar municipality.
- "Deliberating Together on Geological Repository Siting: Expectations and challenges in the Czech Republic", **Karlovy Vary, Czech Republic, October 2012** [12]. Workshop was held in 4 sessions:
  - Legislative and technical background in the Czech republic.
  - Developing confidence in a participatory process of siting
  - Local and regional partnership and added value
  - Expectations for safety assurance, by national, local and regional authorities.

  The context, history and state of art of geological repository siting process in the hosting country was presented and discussed within the sessions. During the sessions, three roundtables were held and, in addition, debate with local public of the Blatno and around villages site, one of the geological repository preselected sites, was organised.

All reports on the national workshops have standard final part where the FSC secretariat – NEA OECD concluded and generalized the workshop findings and discussions from the international perspective.

5.1.2 Topical sessions

The FSC Topical sessions were organized during annual meetings. At more than 10 years existence of FSC, the following topics were addressed and discussed here [2}:

- Stakeholder Involvement Tools: Criteria for Choice and Evaluation (at the FSC meeting in 2003);
- Addressing Issues Raised by Stakeholders: Impacts on Process, Content, and Behaviour in Waste Management Organisations (2004);

- Media Relations (2004, 2005);
- Experience with Electronic, Web and Internet Platforms for Communicating on Radioactive Waste Management (2006);
- Organisational Changes: Cultural and Structural Aspects (2006);
- Tools and Processes for handling of transfer of burdens, knowledge and responsibility: preparing future generations and empowering local communities (2007);
- Tools to Help Society in Decision Making: Legal and Policy Trends (2008).

Topics of three topical sessions were practically identical with the theme of the SITEX WP 5:

- The Link Between Research, Development and Demonstration and Stakeholder Confidence (2005);
- Link Between Research, Development and Demonstration (RD&D) and Stakeholder Confidence: the Specific Aspect of Long-term Safety (2007);
- Link Between Research, Development and Demonstration (RD&D) and Stakeholder Confidence: Use of Analogues for Confidence Building (2008).

Proceedings of the **first one** [13] contain nine papers considering the topic from various points of view, including the final paper stocktaking presented experiences and ideas. The proceedings also contain summaries of presented papers and discussion, as well as considerations on international perspectives of lessons learned. Some of such considerations are mentioned in the following text.

The meeting acknowledged that RD&D is a critical contributor to stakeholder confidence in nuclear waste management approaches. It has a role in both meeting regulatory requirements, and also seeking broader social understanding and confidence in decisions taken. Demonstration plays essential and distinct role here, offering tangible insight to stakeholders, particularly concerning engineering issues.

The need to consider science and research in the broader social context of decision-making was also discussed. In spite of their principal importance, experts do not hold the exclusive right to influence over decision-making they contribute alongside citizens, regulators, governments and implementers. The scientific community needs to engage and respond to the interrogations raised by citizens since quality of science and expertise will ultimately be assessed against criteria established by society. It is important for both implementers and regulators to retain their own capabilities and competence themselves to be also credible in the eyes of stakeholders.

Society expects that a broad range of considerations and expertise will be brought to the waste management projects, and in an integrated way that bridges and builds accountability across disciplines. Social science research is widely acknowledged as having an important role to play alongside technical and scientific investigation.

Affected communities may exert influence by asking questions, identifying new areas of research, reviewing progress and understanding results. Scientists offer confidence to society about the sound quality of its activities. However, it is becoming increasingly recognized that research is not value-free: stakeholder confidence requires that researchers

declare their interests and expose their value frameworks. Experts are being asked to be more open to dialogue – sharing findings as they emerge, including residual areas of uncertainty and incomplete knowledge. Dissemination of research findings and provision for real dialogue about these findings are key to building public.
It is also essential to recognize the potential for the existence of a large knowledge gap, initially, between affected communities and implementers and the importance of community capacity-building to bridge this gap. Experience indicates that building capacity takes significant periods of time. It also indicates that participation and influence cannot be forced by education and information; it must unfold on the terms of the public and local decision makers.
Programs involving sequential decision-making can be informed and enriched by new learning from RD&D provided that such knowledge, skills and capability are effectively sustained over the long-time horizon associated with implementation. RD&D would ensure that institutions retain the flexibility and capability to adapt to changing circumstances and adjust direction as appropriate. This in turn may help ensure that responsible organizations maintain skills and knowledge required to oversee and manage facilities, and address emerging issues long into the future, thereby sustaining public confidence. Within affected communities, an ongoing process of capacity building and revitalization would be required to retain competence, as individuals involved at the local level change over the years.
Experience indicates that transparent and accountable reporting needs to include explicit public recognition of the limits to the current state of knowledge, areas of uncertainty and the areas of continued scientific debate. Experience also indicates that scientific openness does not constitute a goal in itself. Rather, its importance lies in its contribution to broadening the public debate, giving rise to new questions, and structuring scientific investigation in accordance with both the standard requirements of the scientific world as well as societal expectations.
There is a growing body of experience from which lessons can be learned associated with siting large projects in RWM, as well as in other sectors, which offer insights and innovation in bringing together affected organisations and individuals into decision-making processes. As well, through collaborative processes which bring experts and citizens together, experience is being gained with addressing socio-economic and cultural affects to ensure alignment between projects and citizen values and priorities leading to greater stakeholder confidence.
Finally, it is stated that national differences exist in terms of the way in which science and RD&D contribute to stakeholder confidence and decision-making, and the way in which roles and responsibilities have been assigned. The balance between science driven decision-making and broader societally-directed decision-making, and methods for achieving this balance, are at the heart of achieving stakeholder confidence.

The **second of the topical sessions** discussed the link between researchers and stakeholders in regard of area of long-term safety assessment [14]. Presentations at the session were invited from delegates of five RWM organisations, including SKI and KASAM (Sweden), NRC (USA), NWMO (Canada), and HSK (Switzerland), as well as representatives of NEA and its working parties the Integration Group for the Safety Case (IGSC) and the Regulators' Forum. The lessons learned from the presentations and discussions indicate that the expert-citizens

interactions and corresponding processes can be broken up, from methodological point of view, into three stages, namely: framing, assessing and evaluation/action, connected by iterative feedback loops.
The framing stage consists of definition the problem and framing questions, agreement on the process design and definition of options and acceptability criteria. The problem is to manage arising contradictions. For illustration, there is general agreement between regulators and scientists on the main components of a safety case, which includes a variety of numerical criteria (e.g. dose, absolute risk, etc.), calculated for very long time scales. The factors, however, that the public typically considers when judging riskiness are predominantly qualitative (e.g., catastrophe potential, voluntariness, control, equity, etc.) and, for instance, discounted, i.e. manifesting in that the short-term concerns are accorded disproportionately great weight compared to the long-term ones. Therefore, one of the challenges is incorporating into framing the discourses on broader issues, e.g.: prevention, precaution, public control, justice, fairness, balance between short and long-term protection.
The second group of methodological issues concerning the safety case is related to how the stakeholders can be involved in assessing, in other words: how can citizen-based expertise be incorporated into the decision-making process? The third group of methodological problems is related to potential conflicts in the evaluation phase. If various stakeholders evaluate the options, they may draw different conclusions even on the basis of identical assessment data, due to the differences in their value judgements. Usually the most important requirement of stakeholders is the openness and transparency of processes. In case of divergent views, the involvement of a neutral 'third party' may help, who would play the role of facilitator. The high degree of uncertainties associated with RWM due to the long time-scales necessitates an iterative stepwise approach. One of the social, i.e. non technical, answers given to uncertainty is that the retrievability of waste has become a general requirement for any disposal concept. The general philosophy trying to justify such approaches is that they do not shift all the burdens of waste management to the future generations, rather they make it possible for them to have a say in the making of ultimate decisions.

On the **third topical meeting** [15], six presentations relating to the use of analogues for confidence building were presented. At first, the meeting clearly defined the term "analogue" (natural or anthropogenic: archaeological and contemporaneous) on basis of the degree of similarity: when a fairly direct similarity to repository situations exists, the case may be used as an argument to support a phenomenological theory and its modelling. When the degree of similarity is quite low, the case can provide a "common sense" rationale supporting the concept of geological disposal as an option that should be not ruled out and could be a relevant solution, providing that adequate research and demonstration are performed to confirm this hypothesis. Such cases are considered as an "analogy" or even only an "anecdote".
The presentation and following discussion tried to answer on questions like: "Why use analogues?", "Analogues from whom? Which ones? How?". Considering the analogues as line of evidence and confidence building for the general public, most TSC members had the feeling that that analogies and anecdotes could help the public to grasp timescale and

understand the basic rationale and principles of geological disposal. The careful statements in presentations and discussions on efficiency of analogues in public confidence building could originate from the lack of demonstrated evidence of this effect. Some FSC members suggested that national analogues, notably anthropogenic, might be more effective for general public than extra-national ones.
Participants finally formulated suggestions for possible development within the issue:

- Continue efforts to build analogues databases,
- Use such database matrices to integrate the so-called "negative" analogues and investigate thoroughly the cause of perceived discrepancies to transform the case into an added-value analogue,
- Translate the scientific and technical analogues into convincing arguments for the public at large, with specific consideration for national analogues,
- Measure the effectiveness of analogues and related arguments in terms of public confidence-building
- Investigate the repository evolution over time of the type of confidence-building arguments needed for the general public: at first considering existing LILW (short lived) repository projects and, by extension, other controversial industrial projects.

5.1.3 Recent FSC development

Phase 2 (2004-7) and particularly Phase 3 (2008-) of FSC activities, as a result of the brainstorming workshop (2007), re-organized the themes under consideration [16]. The current themes are:

1. The link between technical research, development and demonstration and stakeholder confidence
2. Changing dynamics of interaction among radioactive waste management institutions and stakeholder confidence
3. Media, internal and external communication, and stakeholder confidence
4. Tools and processes to help society prepare and manage decisions (e.g. about technology, sites) through stakeholder involvement
5. Increasing the value of waste management facilities to local communities

It has been decided to look on the particular themes also from the points of view:

a) the symbolic dimension of the theme,
b) FSC consolidation and ways of the knowledge transfer,

so two corresponding themes, transversal to each of above topical ones, have been also formulated.
For each of themes, document [16] lists the background materials and FSC initiating activities and publications which have led to formulation of the theme and a way of its incorporating into the programme of work within the current phase. The coordination with other groups, symbolic dimension of the theme, way of the knowledge transfer is also addressed within each of the themes. All of themes contain a set of grouped questions illustrating the spheres of interest:

1. Within the first theme, they address the issues regarding research and development and its perception by stakeholder groups. Issues like role of analogues, reversibility and retrievability, aspects of (very) long term safety, relationship between uncertainty/certainty on one side and doubt/confidence on the second have been prioritised within the first theme.
2. Formulating the questionnaire mapping the transparency within the second theme added by the set of questions, e.g. on the balance between openness and increasing concerns over security, change/dynamics of roles of different players (regulators, reviewing bodies, etc.), socio-political traditions that weigh upon actors in radioactive waste management institutions, etc.
3. Within the theme 3: communication strategy, experiences with media, issue arising with new media, differences between local and supra-regional media, attitudes of journalists, etc.
4. Issue of the process leadership and coordination between institutional bodies and other institutional organizations within the theme 4. Questions regarding participatory vs. representative democracy, their pros and cons in long-term management problems, ways to handle highly polarized stakeholder views, cultural and societal for helping develop confidence in society's ability to make durable decisions or preserve memory are also planned to discuss through within the FSC activities.
5. Within the theme 5, for instance: how to set up local/regional development programmes? What kind of cultural value could an operating repository have? How about a repository after closure?

5.2 ACN

Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters ("Aarhus Convention") was accepted in Aarhus, Denmark, in 1998 and was put into force on 30 October 2001. Up to now, 46 states have ratified, accepted, approved or accessed to the Aarhus Convention. For completeness' sake, two documents were accepted as additional to the Aarhus Convention:

- The Protocol on Pollutant Release and Transfer Registers, accepted in Kiev, 2003, signed by 29 parties, put into force on 8 October 2009,
- The amendment on public participation in decisions on the deliberate release into the environment and placing on the market of genetically modified organisms, accepted in Almaty, 2005, signed by 27 parties; this document is not yet in force [17].

The first European workshop on the practical implementation of the Aarhus Convention in the nuclear field was held in Luxembourg, June 2009, co-organized by French Association Nationale des Comités et Commissions Locales d'Information (A.N.C.L.I) and European Commission [18]. 44 participants represented 14 countries and next 25 participants represented different organizations (Greenpeace, Aarhus Convention Compliance Committee, Aarhus Secretariat, Foratom, NEA-OECD, etc.), European Commission, ANCLI,

Regional Environmental Centre for Central and Eastern Europe participated on the workshop.

The workshop consisted of three sessions:

- Presentation of the Aarhus Convention and stakes of its implementation in the nuclear field.
- Implementation of Aarhus Convention in the context: issues and practical cases.
- Discussion on Further steps of the "Aarhus Convention and Nuclear" approach at national and Europeans level.

Significant part of the workshop presentations and discussion dealt with the issue of radioactive waste management, e.g.:

- on the Slovenian local partnerships and the COWAM In Practice Slovenian national stakeholders group as an example of pluralistic case study,
- on the contribution of local communities in matters of governance on the issue of nuclear legacy in Great-Britain ("from Sellafield to NDA policy"),
- on local participation on radioactive waste management projects in Romania, presented by the mayor of Saligny (Romanian site for siting and construction of near surface repository).

The first roundtable organized by A.N.C.L.I and European Commission next year [19] addressed itself to the issue of radioactive waste management. The roundtable was enacted in three sessions:

- Access to information. Within the session, two themes were presented and discussed:
  - Examples of the access to information (Belgium, Hungary),
  - Examples of the structures and processes for information (UK, France).
- Access to participation on decision making processes, again with two thematic rounds:
  - Structures and processes for participation, describing Belgian, Slovenian and Swedish partnership between repository implementers and local communities,
  - National cooperation within European projects (with the Czech example regarding the project ARGONA and French example regarding the project CIP).
- How to ensure an effective application of the Aarhus Convention through the third pillar: access to justice:
  - The role of national judges in the implementation of the Aarhus Convention,
  - Conditions for the change for an effective application of the Aarhus Convention: governance approaches, with description of the COWAM project

stages and the guidelines for participation and transparency and their relation to the Aarhus Convention as were treated within the project ARGONA.

The leading theme of the next round table [20] was close to the theme of the project SITEX: (stakeholder) access to expertise and competence building. Three round table presentations and following discussion dealt with radioactive waste management:

- "The role of transparency and experts views in increasing understanding of technical issues" from NDA, UK. Presentation mentioned the West Cumbria Managing Radioactive Waste Safely (MRWS) Partnership, conditions of its functioning, and its standpoints and activities concerning the British Geological Survey report on screening out areas for geological disposal.
- Bulgarian presentation on strategic issues of radioactive waste management and organization of corresponding round tables.
- Presentation regarding the expertise support to MONA ("Mols Overleg Nucleair Afval vzw", the Belgian example of the partnership between NIRAS/ONDRAF, the waste manager in Belgium, and the community of Mol) [21]. The original goal at its foundation was jointly answer to question: under what circumstances is final disposal of LIL short lived-waste feasible and acceptable in Mol? MONA received a lot of expertise from ONDRAF/NIRAS but it was also free to consult with independent experts. Examples of such external expertise were presented at the presentation.

In addition to the European roundtables, links to short information on eight national roundtables (Baltic countries – no information is here yet, Belgium, Bulgaria, France, Hungary, Romania, Slovenia, Ukraine) have been emplaced at the ANC web-page [22]. The national roundtables are a pluralistic group of actors with a significant representation of civil society. They are led by a facilitator or team of facilitators to ensure a balanced dialogue. The national representative ("focal point") of the Aarhus Convention is invited to follow the dialogue. Roundtables are organized in each country on an autonomous basis.
It can be concluded that the European dialogue process, as it was presented on the mentioned ANC events, highlighted that access of civil society to expertise is a key condition for implementing the Aarhus Convention in the nuclear field.

5.3 STAKEHOLDERS INVOLVEMENT ISSUE IN ACTIVITIES OF IAEA

The mission of IAEA in stakeholders involvement is focused mainly on support of networking, exchange of information and support of less developed nuclear programs. Likewise any of IAEA programs, initiatives on stakeholder confidence issue are organised in various manners, e.g.:

- Expert reviews of member states (MS) technical and programme needs.
- Organization and/or participation on the international meetings and conferences.
- Training sessions & workshops aimed at increasing use of "best practice".

- Arranging fellowships and scientific visits for those advancing in competence & responsibility in MS.
- NETWORKS and similar means to promote increased “self help” in the transfer of knowledge and experience.
- Publishing documents.

As a result of various activities regarding the stakeholders involvement, IAEA has been issued several documents [23 - 25]. The Agency gives high priority to waste disposal issues, partly because these are often in the public eye and are seen as creating potential risks and unsolved problems, which may then impinge on the success of nuclear power programmes [26]. Stakeholders involvement take an important topic in waste management.
Over the last decades various ways to involve stakeholders in the decision making process have been implemented, including some that have resulted in negative experiences. As a result of these learning experiences, strategies have been developed which are intended to address the needs of all affected parties and, as such, allow for the successful development of waste disposal facilities. However, even if these approaches share a common background — namely, the fundamental principle of respecting the opinions of all potentially affected parties — they display important differences mirroring

- national culture,
- legislation, political sensitivities,
- precedence events,
- the level of national support towards nuclear technologies,
- the degree of nuclear knowledge and
- education, etc.

Explaining the significance of national specifics and their background is seen as potentially important advice to be provided to countries that are embarking on their first disposal programmes.
IAEA has a “high’ level” programme to assist member states participants in designing and implementing public communications programmes. Public communication in the case of a nuclear emergency is a well-recognized priority area of IAEA support to MS. Building public confidence is a key aspect for “newcomers” aiming to construct NPPs.
There is an observable interaction between the areas of waste technology activity and stakeholder confidence in nuclear technology.
IAEA existing initiatives, in responding to established MS needs are having a positive impact on stakeholder perceptions of nuclear technology. Expanded use of Networks (DISPONET, LABONET, URF, ENVIRONET, IDN) and networking tools (e.g. “new media”) in the WTS is contributing to open sharing of information necessary to build stakeholder confidence.
The recent activities of IAEA in regard of the stakeholders involvement are collected in table 1.

Table 1: Recent IAEA activities related to the stakeholder involvement.

Event	Place	Date	Covering program
IAEA Workshop on Strengthening National Competencies in the Area of Stakeholder Dialogue for Radioactive Waste Disposal	Las Vegas, Nevada, USA	December 6-10, 2010	
Building Partnership in Waste Disposal Programme	Kuala Lumpur, Malaysia	13-15 September 2011	DISPONET (EPPUNE)
Interaction between technical and social aspects for waste disposal programmes	Istanbul, Turkey	July 2-5, 2012	DISPONET (EPPUNE)
Stakeholder Involvement for the siting of radioactive waste repositories: Lessons learnt	Poland, Warsaw	19th – 23rd November, 2012	URF / DISPONET

5.3.1 INSAG

The International Nuclear Safety Group (INSAG) is a group of experts with high professional competence in the field of safety working in regulatory organizations, research and academic institutions and the nuclear industry. INSAG is convened under the auspices of the International Atomic Energy Agency (IAEA) with the objective to provide authoritative advice and guidance on nuclear safety approaches, policies and principles. In particular, INSAG provides recommendations and opinions on current and emerging nuclear safety issues to the IAEA, the nuclear community and the public.

Today, the concerns and expectations of all manner of persons and organizations — from the local farmer to the international financial institution — must be considered.

In 2006, the report "Stakeholder Involvement in Nuclear Issues" was issued [23]. The report is addressed to those who are planning, designing, constructing, operating, decommissioning or regulating nuclear facilities, or managing nuclear facility licensing processes. Such persons may not have a statutory obligation to inform stakeholders of planned projects and the respective impacts on society. Nonetheless, this report advocates the establishment of such a programme even if one is not required by law.

On the base of long-term experiences, INSAG has concluded that the expectations of stakeholders of a right to participate in decisions are something that the nuclear community must address. Further it recognizes the different decision making mechanisms in different countries, cultural differences etc.

From INSAG point of view it is considered as very important fact that stakeholders involvement leads to:

- Substantial improvements in safety
- Enhancement of the general acceptability of the ultimate decisions made
- Better appreciation of risks and benefits

Regulators should establish procedures for meaningful stakeholder interaction. Their involvement may result in attention to issues that otherwise might escape scrutiny. Public confidence is as well as improved if issues that are raised by the public are taken seriously and are carefully and openly evaluated.

5.3.2 Communicator's Toolbox

In recent times, nuclear professionals face increased scrutiny from the public, the media and other constituents. Effective communication is one important way in which an organization can stave off potential crises while positioning itself as a worthy recipient of support and public trust.

On the flip side, poor public communication can contribute to antagonistic environment in which nuclear professionals lose public trust.

The IAEA Division of Public Information has developed web page http://www.iaea.org/nuccomtoolbox/why_introduction.html intended for nuclear communicators who are called upon to talk about the complex issues surrounding nuclear technology.

The Communicator's Toolbox is not directly about stakeholders' involvement, but support these activities via supporting nuclear communicators.

5.3.3 EPPUNE – Expanded Programme of Public Understanding on Nuclear Energy

The EPPUNE programme aims to encourage a balanced and informed debate on nuclear energy by working to foster excellent communications skills and transparency.

Seminars and training workshops are intended as an education tool, providing communication strategy tools and approaches to policy makers, government officials and communicators in the nuclear arena.

The main goal of the project is to assist Member States that have or are embarking on nuclear power programs to adopt transparent, proactive communications policies that engage and inform the media, NGOs and the general public.

The delivery of special training sessions on stakeholder interaction has been greatly appreciated by MS participants and they are wildly supported by Japanese EPPUNE funds of the Government of Japan. A focus of recent activities is on building of stakeholder relationships. Trainings are created to facilitate knowledge gathering and experience sharing, and to develop communication skills. EPPUNE activities have been implemented in the framework of various IAEA networks (e.g. workshops on communications issues and tools).

5.3.4 DISPONET - International Low Level Waste Disposal Network

Following the growing demand from Member States for assistance in disposal of low and intermediate level radioactive waste, a network has been established to increase efficiency in sharing international experience in the area. DISPONET is intended to bring together those planners, developers and operators of disposal facilities who wish to steadily improve international practices and approaches in managing low and intermediate level waste.

Objectives of the network are as follows:

- To coordinate support to organizations or Member States with less advanced programmes for disposal of low level waste, by making available the relevant skills, knowledge, managerial approaches and expertise from Member States with operating disposal facilities;

- To facilitate information and experience sharing amongst organizations with advanced designs and disposal facilities in operation;
- To organize training and demonstration activities with a regional or thematic focus providing hands-on, user-oriented experience and advising on proven technologies;
- To create a forum to receive expert advice and technical guidance for the Agency programme on low level waste disposal; and
- To encourage knowledge transfer regarding good practices in low level waste disposal.

5.3.5 Connecting the Network of Networks for Enhanced Communication and Training (CONNECT)

CONNECT is a next-generation collaboration platform hosted by the IAEA on behalf of its Member States that will provide a gateway for interconnecting existing and planned IAEA Networks, increasing the participation of individuals and organizations involved in them, and making available additional sources of information that complement existing training workshops and meetings.

6 Practical examples of interaction between experts and stakeholders – case studies

6.1 CONTEXT

The quality of interactions between expert organisations, notably TSOs, and civil society is moreover not only a condition for good implementation of the Aarhus convention; it is also recognised in some national contexts as a contribution to the quality of safety of nuclear activities. For instance, in France, the Institute for Radiation Protection and Nuclear Safety (IRSN) has officially recognised civil society as an 4th and complementary pillar of nuclear safety, alongside operators, regulators and TSOs. In the field of radioactive waste management, the contribution of civil society, and in particular local actors, to safety was highlighted in the conclusions of the COWAM 2 (2004-2006) and COWAM in Practice (2006-2009) European research projects on governance of radioactive waste management.

The above-mentioned trend of evolution of governance of nuclear activities and of radioactive waste management in particular also includes the development of stakeholder engagement practices (e.g. partnership approaches in Belgium and Slovenia mentioned in chapter 5.2, or “safe space” approaches for siting of radioactive waste facilities). These practices rely in particular on tools and approaches for access of the engaged civil society actors and local stakeholders to expertise and skill building of these stakeholders. They are implemented with the support from expert organisation, and in particular TSOs. The development of these stakeholder engagement practices is marked by en evolution in

institutional actors' (TSOs, regulators and operators) vision of the added value of stakeholder engagement, from a perspective of "better perception" of institutions' work to "better performance" of institution's missions.

Various processes of interaction between experts and civil society have thus developed in Europe since the mid-1990's, involving different types of experts: institutional experts (TSOs), civil society experts, independent experts (university, foreign experts not engaged in the national context…). In some contexts, these interaction processes took part to and fuelled a evolutions in the way expertise is developed and provided by TSOs, which developed interactions with civil society actors in order to adapt the way expertise is developed and delivered to the needs of civil society. This led expertise processes to incorporate inputs of civil society in various steps: framing the issues, defining hypothesis and assumptions, modelling, interpreting, feedback to the concerned actors, …

This development of interactions between experts and civil society and the evolution of their respective roles constitutes a co-evolution process between expert institutions and civil society that goes through experimentation of new modes of interaction. The TSOs contribute to this co-evolution process in different ways that notably include:

- Supporting civil society engagement and skill building in specific interaction processes (e.g. local partnerships).
- Adapting their culture and procedures to welcome active contributions of civil society as an added value to sustainability, safety, quality of expertise and decisions…
- Directly supporting a permanent and long-term autonomous process in which civil society develops skills, capacities to engage in issues of public interest, networking capacities …

6.1.1 Objectives

The objective of the case studies is to investigate practical implementation of interactions between expert, in particular TSOs, and stakeholders in Europe in the last 15 years by:

- Identify processes of interaction between experts and civil society in the European context in the last 15 years.
- Presenting the case studies and a short analysis of each a case according to a common grid of analysis enabling comparative analysis and drawing of general lessons about the conditions and means of interactions between experts and civil society in the field of radioactive waste management.

6.1.2 Method

These case studies relate to various processes involving interactions between experts in the nuclear field and civil society actors. They are mainly situated in the field of RWM but also include case studies related to innovative processes of interaction in other fields of nuclear activities (i.e. nuclear safety, monitoring of environment and health impacts of nuclear sites including RWM facilities and development of TSO strategy of openness to society in the

nuclear field). The choice of these case studies has also been guided by the possibility to access information in French or English language.
Hereinafter, nine case studies are presented and discussed. They are:

- ARGONA focused science shop on impact of radioactive waste disposal (Czech Republic, 2008).
- ARGONA consensus panel on spent nuclear fuel management alternatives (Czech Republic, 2008).
- ARGONA Interaction Panel on "Siting and safety case" (Czech Republic, 2009).
- COWAM In Practice (CIP) National Stakeholder Groups (Europe, 2007-2009).
- CoRWM citizen panels (United Kingdom, 2005).
- The policy of openness to society of the French Institute for Radiation Protection and Nuclear Safety (France, 2003-…).
- Technical dialogue on radioactive waste management: cooperation between IRSN, ANCCLI and the CLIS de Bure (2012-…).
- Citizen and expert groups for the closure of repository Asse II (Germany, 2007-…).
- Pluralistic expert group on radioecology in Nord-Cotentin (France, 1997-2010).

For more convenient reading, as they share common elements of context, three case studies related to ARGONA European research project are grouped into a common subsection.
Information on the selected cases was gathered through desk study on the basis of the available documentation on the cases in French and English language (with additional exploitation of documents in German language in the case of the citizen and expert groups for the closure of the repository of Asse II). This information has been complemented by two interviews of stakeholders engaged in the ARGONA European research project and the Asse II case.

Grid of analysis

The case studies are presented according to a common grid of analysis, developed hereunder:

1. *Origins and justification of interactions between TSOs and civil society*
   - What is the context of the interaction?
   - What are the main rationales for TSOs to engage with civil society?
2. *Organisation of the interaction process*
   - What was the time frame of the process? Did the process fit in a longer-term strategy of the TSOs or other institutional actors?
   - What were the civil society actors engaged in the process? What was their intended role?
   - What was the organisational framework for the interactions?
   - What other resources than expert workforce were engaged?
3. *Implementation of interaction*
   - Who are the involved experts?

- How and by whom were they chosen?
- What were the rationales for involving different types of experts?
- What was the role of the different types of experts involved?
- What is the role of civil society actors regarding expertise?
- In what parts of the expertise process do civil society actors contribute? (Framing the issue, hypothesis and assumptions, modelling, assessment, interpretation, feedback to the public…)Access of civil society actors to information
  - What type of information did the engaged civil society actors access?
  - Were there pieces of information that represented difficulties of access? For which reason (inexistent information, information held by other actors, confidentiality issues…)?
  - How were these difficulties overcome?
  - Were civil society actors in capacity to commission independent studies, counter-expertise…?

4. *Outcomes of the interaction process and perspectives for SITEX*

- What were the main outcomes for the TSO?
- What were the main outcomes for civil society actors?
- Did the process contribute to more durable changes in the relationships between civil society and TSOs? Between civil society and other institutional actors?

6.2 PRESENTATION OF THE CASE STUDIES

6.2.1 Three interaction processes in the framework of the ARGONA European research project (Czech Republic, 2008-2009)

6.2.1.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN TSOS AND CIVIL SOCIETY

In 2008 and 2009, the ARGONA European research project has experimented three different arenas of interaction between experts and stakeholders in the Czech Republic.

According to the "Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic", construction of a deep geological repository for the direct disposal of spent fuel and other high-level waste is considered the only realistic option for final disposal of the waste. Two suitable sites should be selected before 2015 and included in area development plans.

A first step of the site selection process has been the selection of six sites for geological and borehole surveys and for further characterization. This selection was achieved in 2005; however, the site selection process gave rise to local protest of many local communities against these developments and to demands for strengthening the role of local communities in the siting process (including a right of veto). Between 2003 and 2005, local referenda were held in many communities; most voters rejected the construction of a repository in their vicinity, and also gave local representatives a mandate to apply all the legal measures at their disposal to oppose preparations for a repository. As a result of this opposition, the

national RWM agency (RAWRA) decided a moratorium on all its activities at the six preselected sites for at least five years. However, at the request of the government, from the end of 2008, RAWRA undertook the analysis of geological data on the Czech Republic's five existing military training areas. The desk study showed potentially suitable geological conditions in two of these areas.
However, the "Concept of Radioactive Waste and Spent Nuclear Fuel Management in the Czech Republic" provides for selection of two final sites in 2015, including an environmental impact assessment process (EIA) to be carried out, which will provide opportunities for active involvement of local communities, local associations and the general public. In this context, RAWRA wishes to develop interactions with stakeholders and gain local consent before restarting exploration work.
The three arenas of interaction experimented organised in the framework of ARGONA European research were organised by the research team responsible of the 5th work package (WP5) of the project, focused on "Evaluation, Testing and Application of Participatory Approaches" and led by the Czech Nuclear Research Institute (NRI). These events were not included in the formal decision-making process but were rather intended to provide a safe space for discussion, which means that the 'different stakeholders can move forward together to increase their understanding of the issues and also of their respective views without being committed to find common solutions, which may cause certain stakeholders to feel like hostages for a certain purpose'.
The first of the three events was a focused science shop on the theme of "potential environmental impact of radioactive waste disposal in comparison with other hazardous waste" organised on 12th March 2008. The main objectives of this event were:

- to experiment new types of relationships between stakeholders;
- to develop public awareness in the actual and potential effects of hazardous waste (including radioactive waste) and prioritize questions/uncertainties that people might have in this field.

The 2nd event was a consensus panel on "spent nuclear fuel management alternatives" was organised on 12th June 2008. The main objectives of the consensus panel were:

- to experiment new types of relationships between stakeholders;
- to identify the main criteria relevant to the assessment of the existing alternatives for spent fuel management and determining their importance (weight) from the perspectives of the stakeholders;
- to achieve at least partial consensus on selecting the most suitable alternative.

The third and last event was an interaction panel on Interaction Panel on "Siting and safety case" organised on 6th May 2009. The objectives of the interaction panel were:

- to get participants input to the research in the Czech Republic for the development of a safety case (for final repository for high-level radioactive waste);
- to communicate ideas that could be included in the safety assessment.

6.2.1.2 ORGANISATION OF THE INTERACTION PROCESS

These three successive arenas of interaction took the form of a one-day event but were part of a broader and longer process of testing and implementation of participatory approaches led by the NRI in the framework of ARGONA (of a duration of three years).

The three events were mediated by independent mediators. For the first two events, the mediator was hired from a communication company, while the third event (interaction panel) was mediated by an independent foreign expert, Kjell Anderson, the coordinator of the ARGONA project. All three events had explicit discussion rules that were recalled to the participants in the introduction of the event.

Organisation of the focused science shop on "potential environmental impact of radioactive waste disposal in comparison with other hazardous waste"

The event gathered a diversity of stakeholders including experts from different organisations (see the following subsection) and representatives of municipalities and local actors. Representatives of Ministries (Industry & Trade, Environment), waste producers and NGOs were invited but did not attend. The participants were selected by the NRI and the ARGONA WP5 with the objective of gathering a mixed group including specialists and interested stakeholders with technical and non-technical background.

The focused science shop consisted in an introductory presentation aimed to provide basic information to the participants, followed by four sessions of mediated discussion on the four following topics:

- Differences in the general perception of nuclear waste in comparison with other toxic waste;
- General public awareness of the issue of RWM and & toxic waste management;
- Technologies for management & ultimate disposal of RW and other toxic waste;
- the NIMBY effect.

<u>Organisation of the consensus panel on "spent nuclear fuel management alternatives"</u>

The consensus panel gathered a diversity of stakeholders including

- experts from different organisations (see the following subsection);
- one environmental NGO;
- representatives of municipalities and local actors;
- ministries (Industry & Trade, Environment) and waste producers (ČEZ electricity company).

The National Radiation Protection Institute and was invited but did not attend. As for the science shop, the participants were selected by the NRI and the ARGONA WP5 with the objective of gathering a mixed group including specialists and interested stakeholders with technical and non-technical background.

The consensus panel consisted in an introductory presentation aimed to provide basic information to the participants, followed by four sessions of mediated discussion on the four following topics:

- the main criteria relevant for assessing the possible alternatives for managing spent nuclear fuel and their importance from the point of view of all stakeholders;

- the possible or probable alternatives existing in the field of spent nuclear fuel management
- the reasons leading to different approaches to spent nuclear fuel management;
- how and to whom the relevant information required for the decision-making processes in this field should be offered?

Organisation of the interaction panel on "Siting and safety case"

Considering the objectives of this event, a narrower audience than for the first two ARGONA interaction events was selected. The participants consisted mainly of experts that are involved in formulating the safety assessment and strategy for deep geological repository siting (see details in the following subsection), with the participation of a few stakeholders (representatives of NGOs and of waste producers). The Main Ministries concerned by radioactive waste management (Ministries of Industry, of Trade and of Environment) were invited but did not attend.

The interaction panel consisted in an introductory session and a discussion session. The introductory session included three introductory presentations aimed to present the context of the interaction panel (presentation made by the mediator), to share an overview of RAWRA's approaches to the issues of safety case and siting in geological repository development (presentation made by RAWRA) and to present the existing uncertainties in the area of the safety analysis of deep geological repository and quantification of the source term (presentation made by a representative of the Faculty of Nuclear Sciences and Physical Engineering of Prague). The discussion session consisted in facilitated discussion between the participants on two main issues:

- involvement of stakeholders in the process of formulating the safety case (for a final repository of high level radioactive waste);
- kinds of information and arguments of primary importance for safety assessment.

Finally, questionnaire for feedback on the process distributed to participants after the interaction panel.

6.2.1.3 IMPLEMENTATION OF INTERACTION

For all three events, the participating experts were selected by the NRI and the ARGONA WP5 research team with the objective of providing a plurality of expert views on the addressed issues.

Implementation of expertise in the focused science shop on "potential environmental impact of radioactive waste disposal in comparison with other hazardous waste"

The focused science shop involved the participation of a diversity of experts from the NRI, Universities, the State Office for Nuclear Safety (SONS – regulator of nuclear activities in the Czech Republic), the National Radiation Protection Institute (NRPI) and RAWRA.

The role of the experts in the focused science shop was to provide information and insights on technical issues. No differentiated roles were attributed to the different experts, except for NRI that was responsible of making an introductory presentation before discussions.

In this process, the role of the participating civil society actors was essentially to take benefit from expertise rather to contribute to the expertise itself.

Implementation of expertise in the consensus panel on "spent nuclear fuel management alternatives"

A diversity of experts took part to the consensus panel: members of the NRI, university researchers and representatives of State Office for Nuclear Safety (SONS – regulator of nuclear activities in the Czech Republic) and of RAWRA. Foreign observers from the research team of ARGONA WP5 also took part to the event.

The role of the experts in the consensus panel was to provide information and insights on technical issues and to act take part to the discussions as stakeholders. No differentiated roles were attributed to the different experts, except for NRI that was responsible of making an introductory presentation before discussions.

In this process, the role of the participating civil society actors was

- to take benefit from the available expertise to refine their understanding of spent fuel management issues;
- to contribute to define, jointly with the experts, mutually relevant criteria for assessing management options;
- help experts refining their understanding of information and public participation issues.

Implementation of expertise in the interaction panel on "Siting and safety case"

The core of the event has been to enable interactions, in a "safe space" of discussion, between the different experts that are involved in formulating the safety assessment and strategy for deep geological repository siting. The event thus gathered a diversity of experts involved in formulating the safety assessment and strategy for deep geological repository siting: members of the NRI, university researchers and representatives of the State Office for Nuclear Safety (SONS – regulator of nuclear activities in the Czech Republic) and of RAWRA.

The role of these experts in the interaction panel was to provide insights on the two addressed issues and exchange views in a group mostly composed of experts. No differentiated roles were attributed to the different experts, except for the mediator, for RAWRA and for the Faculty of Nuclear Sciences and Physical engineering of Prague, that were responsible of the introductory presentations in addition of being a participant in the facilitated discussions.

The few participating civil society actors (representatives of NGOs) were both contributors in the discussion on the issues addressed and beneficiaries as they got information from experts in the introductory session and in the discussion process.

6.2.1.4 ACCESS OF CIVIL SOCIETY ACTORS TO INFORMATION

In the three events organised in the framework of ARGONA, there were no specific tools for civil society access to information. The stakeholders from civil society who took part to each event had access to information through the introductory presentations, on the one hand, and through interactions with a group of experts of different origins able to deliver information and answer their questions.

6.2.1.5 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

Outcomes of the focused science shop on "potential environmental impact of radioactive waste disposal in comparison with other hazardous waste"

In the Czech context, the focused science shop represented a step forward in communication between experts and local actors through structured dialogue on radioactive waste management issues between local stakeholders (including municipalities) and a wide range of experts. In particular, the event enabled the local stakeholders to acquire new information and exchange of opinions among themselves and with experts.

As a part of the broader ARGONA project, this first interaction between civil society actors and experts has set ground for future cooperation within the ARGONA project, as the participating local actors agreed to participate in next participatory event organised in the framework of ARGONA (consensus panel on spent nuclear fuel management alternatives – see next subsection). However, the absence of key stakeholders (Ministries & NGOs)limited usefulness of the conclusions of discussions in the perspective of the Czech decision-making process.

Outcomes of the consensus panel on "spent nuclear fuel management alternatives"

The consensus panel enabled the participants to agree on criteria for the assessment of high-level waste (HLW) management (including techno-economical and socio-political criteria). The event also enabled participants to agree on a sorting of the criteria by importance, in which social and political criteria were identified as being the most important.

The consensus panel also enabled the participants to identify five possible variants or scenario for spent nuclear fuel management, including the zero variant (i.e. long-term storage).

One of the objectives of the consensus panel, the assessment of the variants, could not be fulfilled, as the participants mutually agreed that it would be unviable considering the short duration of the event and the fact that such exercise would require much more detailed information about the different scenarios.

However, there was a general agreement among the participants that the meeting could be the beginning of a broader discussion across the entire spectrum of stakeholders. Suggestions were made for a future dialogue process.

Finally, the consensus panel led to the validation of the method by the participants as the consensus panel has been considered as a "safe space" of interactions.

Outcomes of the interaction panel on "Siting and safety case"

The ARGONA interaction panel was recognised by the participants as being the first meeting of this type in the Czech context, which demonstrated the possibilities for discussion among expert community on the issue of safety case. The event enabled the participants to begin building common language in the expert community and the participating NGOs through a clarification of language and terms.

However, the absence of key stakeholders (i.e. Ministries) made the conclusions of the discussions of limited usefulness in the national context. Moreover, the discussions have been mostly of a general nature given the early stage of siting and safety case in Czech republic. Therefore, the discussion could not lead to conclusions of a practical use.

The questionnaire answered by the participants after the event demonstrated that the interaction panel has a positive reception by the participants, who wish to continue discussion in the expert community and with stakeholders after the event.
Finally, the discussions during the event and the questionnaire answered by the participants showed that the interaction method has been validated by the participants, who agreed that each participant had the same opportunity to express his opinions.

6.2.2 COWAM In Practice (CIP) National Stakeholder Groups (Europe, 2007-2009)

6.2.2.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN TSOS AND CIVIL SOCIETY

The National Stakeholder Groups (NSG) under consideration were created in the framework of a European Research project, COWAM in Practice (CIP), developed from 2007 to 2009. This project was a research-action project mixing thematic research on radioactive waste management and the development of national dialogue spaces in 5 EU countries. CIP focused on three themes: local democracy and governance of radioactive waste management (RWM), long-term governance of RWM, affected communities and sustainable territorial development encompassing RWM.
The project included five countries: France, Romania, Slovenia, Spain and the United Kingdom. In each country, the CIP research team set up a pluralistic National Stakeholder Group. The National Stakeholder Groups was not included in the corresponding national decision-making processes but was intended to provide a safe space of dialogue between the different stakeholders (including operators, experts and regulators) in parallel to the formal decision-making processes. The National Stakeholder Groups aimed to respond to the following objectives:

- Gathering all types of stakeholders from national, regional and local levels;
- Facilitating cooperative investigations (involving the different concerned categories of stakeholders and notably the civil society and the experts) on chosen issues related to the national radioactive waste management context and the current steps of the decision-making process;
- Testing out inclusive governance approach by practicing new style of relations;
- Contributing to the Reframing of RWM issues according to the stakes, concerns, perspectives and goals of the different categories of actors.

6.2.2.2 ORGANISATION OF THE INTERACTION PROCESS

Each NSG was facilitated by a CIP partner (National Facilitator) from the corresponding country. For each NSG, the first phase of the works of the group has been a preparation phase in which the facilitator of the group (from the CIP research team), the chairman of the group (a local stakeholder, in most cases a local elected official) and the participants have negotiated the objectives, scope and expected outcomes of the NSG. The rules of operation of each NSG have been subject to a common agreement between the CIP research team and the members of the group. This agreement has been formalised in a Charter that establishes the basic rules of operation of the group that was undersigned by the participants.

Each NSG then held five meeting throughout the 3-years duration of the CIP project. The first phase of the work program of the NSG was dedicated to the identification of the topical issues to be investigated according to the concern and questions of the different categories of stakeholders involved. Each NSG elaborated its own list of topic on the basis of a co-operative methodology implemented by the national facilitator. The members of the group dedicated the other four meetings to the development of a cooperative investigation of the chosen issues, with inputs from the CIP research team and the experts of the NSG.

6.2.2.3 IMPLEMENTATION OF INTERACTION

The NSGs involved a wide range of experts: technical support organisations (TSOs), research organisation, regulators, radioactive waste operators, independent experts, NGOs, waste producers…

The participating experts and the members of the NSGs were chosen by common agreement of the facilitator (member of CIP research team) and the chairman of each group. The choice of the experts taking part to the National Stakeholder Group was driven by the objective of covering the whole spectrum of the types of experts concerned by radioactive waste management.

The role of experts was differentiated between the two types of experts taking part to the meetings of the NSGs. The experts of each NSG have provided their group with information and insights (based on their own expertise as well as on available technical information, and on their national RWM governance framework) and therefore have contributed to debates and investigation of the issues chosen by each NSG.

In addition, a pool of European experts, members of the CIP research team have developed, along the 3 years of the CIP project, specific research contributions (the research briefs) and taken part to NSG meetings, in order to bring their results and put them into discussion. The CIP European research brief program targeted on the various concerns and areas of investigation identified by the 5 NSGs in the first phase of the project.

In some cases, in addition to the plenary National Stakeholder Group meetings, some ad-hoc meetings were organised between CIP experts and civil society organisations in order to support their investigation and framing of their own questions and concerns vis-à-vis the list of topics addressed by their NSG (on the basis of a corporative methodology, see above)

The process developed by the NSGs along the five meetings was a collective learning process in which the role of the civil society actors was: 1) to better understand the stakes linked to radioactive waste management in their national context, 2) to contribute to the framing of the topical issues addressed by their NSG and 3) as much as possible to raise the influence of the civil society and facilitate a transition towards more inclusive patterns governance of RWM.

6.2.2.4 ACCESS OF CIVIL SOCIETY ACTORS TO INFORMATION

The NSG meetings contributed to the access of information for civil society actors taking part to the group. Through the presence of experts and the contribution of the CIP research team, they had access to technical information, information on the legal and political framework of RWM, as well as on specific topics such as the question of reversibility of RWM (in the French context).

Moreover, the NSG meetings have also facilitated cross-national information on the practices of governance and stakeholder engagement strategies developed in other national contexts in Europe in the field of RWM, thus playing a role of European benchmarking in the field of governance.

6.2.2.5 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

The works of the NSGs enabled experimenting regular cooperation relations among the members of the groups (representing the various categories of local and national RWM stakeholders) during three years, in a context that was relatively freed from the stakes and tensions of actual decision-making process. In effect, the NSGs were not arenas for decisions or for the preparation of recommendations but areas for jointly developing a better understanding of issues related to radioactive waste management governance. These interactions led in each of the national contexts to some evolution:

- of the framing of issues as a result of interactions. Some issues were significantly reframed as a result of the NSG process (e.g. the reversibility issue in France);
- of the pattern of relations between the civil society actors and the institutional stakeholders engaged in the decision-making processes. This resulted from several factors such as the development of cooperative interactions of the NSG participants, the reframing of the considered issues and the structured engagement of the civil society participants.

More precisely, the engagement of the civil society participants in the NSG was facilitated by:

- a clear framework of participation in the NSG that was negotiated by the participants in the first stage of the project,
- the participation of an independent facilitator hired by the research project, and the chairmanship of the NSG, in most case, by a concerned local elected official,
- the possibility for the civil society participants to contribute to the framing of the NSG topical issues as well as to the orientation of the CIP research briefs objectives,
- the support of expertise (both from national and European levels),
- a better understanding of the role, remit, expertise of the various categories of stakeholders involved in their national RWM governance framework, notably as a result of their participation to the NSG debates involving the various categories of stakeholders.
- the results of the NSG investigations contributing to a better identification of the issues at stake but also to reframe the understanding of the topics addressed by the NSG as a result of their participation.

The results of the investigations of each National Stakeholder Group were made available publicly through the production of national reports synthesising the outcomes of the cooperative investigation on the addressed themes. Thus, the outcomes of the works of the

National Stakeholder Group could be used as reference by the stakeholders beyond the end of the CIP project.
Finally, on a degree depending on each country, ground was set for more cooperative interactions between civil society and institutional actors.

6.2.3 CoRWM citizen panels (United Kingdom, 2005)

6.2.3.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN TSOS AND CIVIL SOCIETY

The considered citizen panels take place in the framework of the activities of the Committee on Radioactive Waste Management (CoRWM) developed from 2003 to 2006. These activities were developed in a national context where, after failures of previous approaches, the British Government decided to restart the development of radioactive waste management policy from the beginning, i.e. the selection of general options.
In order to get assistance and advice and to develop trust in the decision-making process, the British Government created in 2003 an independent expert committee, CoRWM, with a mission to provide independent scrutiny and advice to the UK governments on the long-term management of higher activity radioactive waste.
The first mission of CoRWM was to oversee a review of options for managing solid radioactive waste in the UK and to recommend option or options that can provide a long-term solution, providing protection for people and the environment.
In the framework of this mission, CoRWM commissioned four citizen panels as part of its Public and Stakeholder Engagement approach in 2005. In these panels, the main rationales for developing interactions between experts and stakeholders were:

- to implement CoRWM specifications, which included requirements of openness, transparency and inclusiveness;
- to gain trust in CoRWM's recommendations;
- to bring answers to public concerns.

6.2.3.2 ORGANISATION OF THE INTERACTION PROCESS

A first round of four panels have been organised in North England, South England, Wales and Scotland. These panels were intended for CoRWM to understand public concerns, for introducing participants to radioactive waste management issues and explore their views and for option assessment exercise performed by citizens on CoRWM's "long list" of options.
The panels gathered a sample of 16 citizens of mixed age, gender and social class of the considered regional area. These panels were not representative in a statistical way but were able to provide a good understanding of range of views of the general public. The selection of citizens excluded people belonging to anti-nuclear groups, people with household members working in the nuclear industry and local councillors and journalists. The panels also included experts and CoRWM members.
After this 1st round of panels, the panels were later reconvened at the same location and with the same participants in order to get citizens' input into the assessment of CoRWM short list of options. In this second round of panels, the day was divided in two different sessions. In the morning, the participants were given the opportunity to have more individualised interactions with the experts under the form of a "parents evening style"

session. The afternoon was dedicated to a plenary session where citizens asked the experts questions that they previously prepared. This afternoon plenary session also included a short-listed options weighting exercise and a discussion on ethical issues

6.2.3.3 IMPLEMENTATION OF INTERACTION

In each panel, five experts were included, covering a field of knowledge and perspectives that encompassed:

- Geological disposal (an expert from the Nuclear Industry Radioactive Waste Executive – NIREX);
- Storage (an expert from the British Nuclear Group);
- Regulation (an expert from the Environment Agency, the Scottish Environmental Protection Agency or the Health Protection Agency – depending on the localisation of the panel);
- Environmental NGOs;
- Independent academics (in the fields of ethics, economics and biological effects of radiation).

In addition, two or 3 CoRWM members also took part to the panels and played the role of specialists.
In these panels, the role of citizens was to contribute to CoRWM's option short-listing process, to contribute to development of option assessment criteria, to develop perspectives on ethical issues and to comment on CoRWM's programme for assessment of short-listed options.
The role of the experts was to provide a predefined information package to the citizens and to answer their questions in order to help them form their opinion.

6.2.3.4 ACCESS OF CIVIL SOCIETY ACTORS TO INFORMATION

In this process, the participating citizens were provided under two different forms. The first one was during the plenary sessions, where experts provided information to the group of citizens and answered their questions.
The second modality of access to information was the "parents evening style" session of the second round of panels, where pair of citizens had 15 minutes meetings with each expert in turn.

6.2.3.5 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

The citizen panel process enabled CoRWM to get an appreciation of the views of the general public on its proposals (the long list of options, then the short list of options. It also enabled CoRWM to get an assessment and weighting of options from a citizen point of view. However, this could not be generalised because of great differences of weighting in the different panels. Finally, CoRWM also obtained useful information in terms of ethical approach to radioactive waste management.
Citizens obtained information on radioactive waste management issues. However, there was little empowerment as citizens were selected not to be stakeholders (exclusion of local councillors, anti-nuclear groups, people having links with nuclear industry).

6.2.4 The policy of openness to society of the French Institute for Radiation Protection and Nuclear Safety (France, 2003-…)

6.2.4.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN IRSN AND CIVIL SOCIETY

Since the late 1990s, the French Institute for Radiation Protection and Nuclear Safety (IRSN) has continuously implemented a policy of openness to society that has contributed to modify the way expertise is framed and made available by the IRSN.

This process began in a national context of risk governance evolution towards more transparency. In the wake of several public health scandals such as the European "Mad Cow crisis" and the French "infected blood scandal", which took place in the 1990s, the public became more demanding. The expectation levels were especially raised regarding transparency and openness of expertise processes. Another major issue was (and still is) the independence of expertise organisations from the decision-making institutions as well as from the industry. This concern was one of the reasons that led to the creation in 2002 of IRSN as an independent public expert and nuclear safety and radiation protection.

In addition to the rising public expectations, and not without link to this evolution, a series of new legal requirements were implemented towards more transparency and more public participation in the decision making process. At the international level, the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters was done in 1998. The parties to this Convention include EU member states such as France, but also the European Union itself. In France, several legal provisions were taken to enhance transparency and public participation in general. A special attention was paid to environment-related decisions. The nuclear field was also the object of specific legislation, the main being the Nuclear Transparency and Security Act ("TSN Act"), passed in 2006.

In that context, IRSN sought to develop an overlooked aspect of its mission, to evolve from being a public expert organisation supporting the decision-making organisations towards being an expert acting also directly for the public. IRSN's policy of openness to society aimed at reaching this objective by increasing the transparency of its expertise processes and results, but also by experimenting new relationships with stakeholders from the civil society, and supporting the development of their technical capacities in nuclear safety and radiation protection.

For the IRSN, the rationales for involving different types of experts and developing interactions with civil society in expertise processes are:

- to frame the issues addressed and organise the expertise processes in the most meaningful and useful way possible for the public;
- to develop skills of IRSN experts through interactions with civil society;
- to improve transparency and credibility of IRSN's expertise.

6.2.4.2 ORGANISATION OF THE INTERACTION PROCESS

The IRSN's policy grew continuously from the 1990s to the present day, through several important milestones. The first one was the creation in 1997 of the GRNC (Nord-Cotentin

Radioecology Group), first of a series of pluralistic groups involving civil society, public experts, operators, authorities, etc. on nuclear topics. The second was the creation within IRSN of a department dedicated to stakeholders' involvement. This unit aimed at:

- being an access point for stakeholders from the civil society;
- involving IRSN in European projects related to risk governance (e.g. the COWAM 2 and COWAM in Practice projects on the governance of radioactive waste management, or the EURANOS and NERIS European research projects on emergency and post-accident preparedness and management);
- and supporting operational IRSN teams in their interactions with stakeholders.

New relationships with stakeholders were developed through an experimental approach relying on pilot projects in which IRSN experts engaged in interactions with stakeholders from the civil society on concrete cases.
The organisation set up by IRSN to develop its policy was complemented by a cooperation agreement signed in 2003 with the National Association of Local Information Commissions (ANCCLI). The Local Information Commissions (Commissions Locales d'Information – CLIs) are oversight bodies attached to each nuclear site. They are composed of a variety of local stakeholders, with at least half of their members being elected officials and the others coming from each of the following categories: NGOs, labour union representatives and qualified personalities). Their role is to monitor the activities of the nuclear site to which it is attached and to inform the public. The 2003 cooperation agreement envisioned cooperation between IRSN and the CLIs on pilot projects and the creation of joint thematic working groups on topics of particular interest for the CLIs.
The engagement of the IRSN towards openness to society was reaffirmed in 2006, with the renewal of the performance agreement between the IRSN and the State. Indeed, the new performance agreement counted among its four strategic pillars "meeting the needs of other social and economic actors".
IRSN's openness principles were officially coined in 2009 under the form of a Charter of Openness to Society. This charter sanctioned a process started months before with several public scientific and technical institutes covering different fields of activity. Together, IRSN and three partnering institutions signed the common Charter in October 2008. IRSN then worked on a specific Charter tailored to its missions and goals. It was made public in April 2009.

6.2.4.3 IMPLEMENTATION OF INTERACTION

When it comes to transparency and openness of expertise, the way the expertise is made accessible to the multiple stakeholders is not the only stake. The way expertise is framed and the way it is performed also play a major role.
Through pilot projects and joint working groups, IRSN experts and civil society representatives engaged in nuclear issues (including civil society experts) experiment ways to organise, implement and make expertise results available. The cooperation between the IRSN, the CLIs and the ANCCLI plays a key role here since the CLIs gather stakeholders that are engaged in the follow-up of nuclear sites and can engage in technical discussions.

In this process, civil society actors are both beneficiary and contributors to the expertise process. In effect, civil society benefits from an enhanced capacity of the IRSN to answer the needs of the public. In return civil society actors engaged in the pilot projects contribute to the expertise process in various ways: framing the issue, hypothesis and assumptions, modelling, assessment, interpretation and feedback to the public (depending on the considered pilot project).

As regards access to information, the IRSN has developed two complementary visions of transparency: "regular" and active transparency.

"Regular" transparency consists in making available to all stakeholders the final results of the work carried out by the IRSN in the framework of its national mission of radiological monitoring of the environment and human health. The IRSN also makes available the positions that are issued to the French Nuclear Safety Authority (Autorité de sûreté nucléaire – ASN), within conditions mutually agreed between the IRSN and the ASN. While the IRSN also performs expertise activities in the framework of commercial and scientific contracts, it systematically includes the principle of public access to the results in the negotiations with its partners. Finally, the IRSN also responds to the requests for information that are given in accordance with the requirements of the right of access to information.

Active transparency is related to a process of interaction with stakeholders that aims to ensure that practical conditions for knowledge and information sharing are effectively met. It includes supporting civil society actors in the development of the skills and knowledge necessary to their engagement, through trainings, dialogue and pilot projects.

6.2.4.4 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

The IRSN practice of openness to society has been resulting in new ways of thinking the roles of IRSN and the stakeholders in the expertise process, in particular:

- the development of new ways for IRSN to perform its expertise in interaction with stakeholders;
- the development of stakeholders' technical skills and knowledge and of their capacity to develop technical investigations;

The global result also is a contribution to the enhancement of the quality of expertise provided by the IRSN as a result of stakeholder engagement and an improvement of visibility and accountability of IRSN's actions.

The feedback of experience of this policy developed by the IRSN, the CLIs and ANCCLI shows that involvement of civil society actors has become part of the expertise process and went further than mere adaptation of existing expertise procedures.

6.2.5 Technical dialogue on radioactive waste management: cooperation between IRSN, ANCCLI and the CLIS de Bure (2012-…)

6.2.5.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN IRSN AND CIVIL SOCIETY

Over the past few years, IRSN has been regularly collaborating with 38 the French local information commissions (CLI) and their national association the ANCCLI (as indicated in part 6.2.4 of this document), providing technical support to their capacity-building effort on nuclear safety and radiation protection.

A recent experience was the support IRSN brought to ANCCLI in the wake of the Fukushima accident, so that the CLI members could follow in the most efficient way possible the stress tests launched at a national and European level. After this fruitful experience, ANCCLI was eager to keep collaborating closely with IRSN on safety case studies. One of the topics singled out by ANCCLI was the upcoming milestone on the project "Cigéo", a project of geological disposal designed to manage the high level (HLW) and intermediate level-long-lived radioactive waste (IL-LLW).

Along with ANCCLI, the Local Information and Oversight Committee (CLIS) of Bure, a frequent partner of IRSN, was interested to launch an initiative on this issue. Indeed, The CLIS is especially concerned with Cigéo, since it is the local committee attached to the Bure underground research laboratory, where the French radioactive waste agency Andra studies the local clay in order to evaluate its capacity to host waste.

With a National Public Debate on Cigéo scheduled for 2013 as a first step in a multi-year decision-making process, IRSN, ANCCLI and the CLIS de Bure launched a joint initiative in 2012, pursuing the following goals:

- To inaugurate an early and durable dialogue between IRSN, ANCCLI and the CLIS designed to accompany a multi-year decision-making process
- To allow ANCCLI and the CLIS grasping the main technical issues at stake before the start of the Public Debate,
- To facilitate the ANCCLI's and CLIS' involvement in the Debate

6.2.5.2 ORGANISATION OF THE INTERACTION PROCESS

The first step in the "Dialogue" initiative was to clarify what the stakes were for all the stakeholders involved. Indeed, we can expect the NGOs, the nuclear operators, the radioactive waste implementer, the nuclear safety authority, the public expert, etc. to have different takes on what matters most regarding the Cigéo project.

From June to December 2012, the aim therefore was to define the stakes and try to reach an understanding on the subject.

The starting point was a meeting set up in June 2012, where the implementer, the local actors, the NGOs, the authorities and the experts presented what the stakes were according to them. The discussion that followed allowed reaching a common ground on which the Dialogue could be based.

Three main topics were identified as particularly significant for all stakeholders:

1. Radioactive waste inventory, management options and impact on those of energy policy changes.
2. Storage vs. disposal, and reversibility
3. Safety, radiation protection, health and environmental monitoring.

During the Fall 2012, three groups worked on these topics in order to clarify the questions encompassed by each one. In December, an extended seminar attended by CLI members confirmed the identified stakes and allowed building a work program to attempt addressing them.

6.2.5.3 IMPLEMENTATION OF INTERACTION

On April 8, 2013, a conference open to all CLI members on the topic "Your waste: what solutions?" served as a teaser for all people unfamiliar with radioactive waste. It gave to the 80-odd participants an overview of the situation in France and abroad.

The following day, IRSN presented to an audience of 70 persons (including representatives from 20 different CLI, operators, implementers, authority, etc.), its main expertise findings, addressing the issues raised during the first phase of the "Dialogue". The relevant reports, from years 2005, 2009 and 2012 were made available to the public. They are accessible on IRSN's website.
From May to December, the "Dialogue" has been suspended to allow the Public Debate to run its course. It will resume in earnest in 2014 to address issues such as reversibility, confinement properties of clay, etc.

6.2.5.4 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

The cooperation process resulted in competence building for the members of the working groups and the people who participated to the April workshop. This includes the participating CLIs but also the IRSN experts, who improved their understanding of the stakes as seen by the CLI members and enhanced their capacity to interact with them.
As a result, the CLI members felt ready to take part in the Public Debate which opened in May 2013.
Moreover, the initiative developed and/or confirmed the interest of several CLI members for the issue of waste management. They are now looking forward to resuming the discussions in 2014.

6.2.6 Citizen and expert groups for the closure of repository Asse II (Germany, 2007-…)

6.2.6.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN TSOS AND CIVIL SOCIETY

In Germany, low and intermediate level radioactive waste (LILW) was disposed of from 1965 to 1978 in the Asse II repository, which was at that time a research mine operated by the German Institute for Radiation Protection and Environmental Research (GFS - Gesellschaft für Strahlen- und Umweltforschung).
From 1988, degradation of the repository was observed, including movements of the salt rock strata and influx of brine. From this time, stabilisation works were carried out by GFS. Due to danger of flooding and collapse, the closure of the repository was decided by GFS in 1997. However, criticism from local stakeholders, including local communities, has progressively developed as regards transparency of the process of closure of Asse II, but also as regards radiation protection issues. Public authorities at the local, district and county level officially adopted in March 2006 of a common resolution asking to develop a comparative assessment of possible options for closure, apply the legal framework for radioactive materials rather than the mining law and have the mine operated by a federal public entity.
In response, the competent Federal Ministries (BMU and BMBF) and the Ministry for the Environment and Climate Protection of Lower Saxony (NMU - Niedersächsisches Ministerium für Umwelt und Klimaschutz) initiated a public participation process in the beginning of

2008. This public participation process was developed to enable local and regional stakeholders to exert close follow-up of the process of closure of the mine, to build trust in the decision-making process and to anticipate and prepare answer to legal requirements in terms of public participation.
In September 2008, BMU, BMBF and NMU transferred ownership and operation of the mine to the Federal Office for Radiation Protection (BfS). The mine also changed status and became subjected to the legal procedure applying to radioactive waste repositories. BfS created a specific legal entity for operating the closure of the mine: Asse GmbH company.
During the year 2009, BfS carried out the first step in the decision-making process, which is the comparative assessment of the 3 different possible options for Asse II closure: backfilling, waste retrieval or internal relocation of waste packages. At the end of this step, BfS took the decision, supported by the stakeholders, to retrieve the waste. Feasibility studies for retrieval are now under progress.

6.2.6.2 ORGANISATION OF THE INTERACTION PROCESS

From the beginning, the very structure of the process has been worked out with the local and regional stakeholders, resulting to the current and still operating participation process. The structure of the process involves two different bodies (see scheme below):

- A Citizen Advisory Group (CAG), which is a regional forum for information sharing and discussions between regional and local elected representatives, civil society organisations, the operator of the mine and the concerned ministries. The CAG also plays the role relaying local concerns and problems of the local population and the Asse II employees.
- An Expert Advisory Group (EAG), which has a role of information and advice for the Citizen Advisory Group.

The CAG is composed of members with and without voting powers. The members of voting powers are elected representatives of the region, of local communities as well as 4 representatives of different political parties, NGOs and citizen initiatives. Members without voting powers are experts, operator (BfS and ASSE GmbH) and authorities (BMU, BMBF and NMU).
It has convened about 7 times per year meetings a year with the all members of the group since January 2008. In addition, other meetings gathering only members with voting power were also organised.
The EAG is composed of 3 experts of the Karlsruhe Institute of Technology and 5 experts chosen by the CAG. The experts chosen by the CAG are in a position of proximity with civil society and NGOs concerns. Since its creation, the EAG had meetings monthly.

6.2.6.3 IMPLEMENTATION OF INTERACTION

Expertise is a core issue in the public participation process on Asse II closure. The function of expertise is of foremost importance in the process and is essentially performed, on the one hand, by Asse GmbH and BfS as the operator of the mine and, on the other hand, by the Expert Advisory Group (EAG) supporting the works of the Citizen Advisory Group (CAG). The EAG notably carries out the task of analysing and commenting BfS plans for the mine. It can

be mandated by the CAG to address specific technical or scientific issues. In addition, the EAG also addresses issues of its own choice.

The works carried out by the EAG has included among others reviewing:

- the conception criteria proposed by BfS;
- the options for improving the security situation in the context of the closure of the mine (which were discussed intensively);
- emergency planning (which were a requirement of the nuclear regulations newly applied to the mine), including reviewing the analysis of accidents of the former operator.

The EAG has extended its fields of expertise over time as two members (a physicist and an engineer) have been added since 2008 in order to respond to emerging needs. In addition to the expertise capacities of its members, the EAG has also the possibility to commission other experts for support to specific topics.
The EAG has close interactions with the CAG as 5 members of the EAG are non-voting members of the CAG. During the ACG meetings, the EAG presents the outcomes of its works. As far as possible, the EAG members try to reach consensus on the outcomes of the EAG works. However, in some cases where consensus could not be reached, the reports of the EAG were issued including clear mention of the dissension points and the position of the members who did not agree.
Access of civil society actors to information
The issue of access of civil society to information can be divided into 2 levels: access of members of the CAG to information and access of civil society at large to information.
As regards CAG members, the members have access to

- information (documents made available to CAG members and presentations during the CAG meetings) provided by BfS and Asse GmbH as well as BMU, NMNF and NMU which are non-voting members of the CAG;
- information provided by the EAG.

In order to make information available to a wider range of civil society actors (in particular local actors), both BfS and the CAG organise information diffusion. BfS provides information through a specific website[1], distributes a quarterly newsletter in to all inhabitants of the County and organises local public meetings regularly. The CAG has its own website[2] and also organises local public meetings on a regular basis. Experts from the EAG participate in these public meetings.
These public meetings are occasion for the general public to receive information but also ask questions and receive answers from BfS, Asse II GmbH and the CAG and EAG.
In addition to the information diffusion carried out by BfS and the CAG, different citizen initiatives also organise public meetings.

[1] http://www.endlager-asse.de
[2] http://www.asse-2-begleitgruppe.de

6.2.6.4 OUTCOMES OF THE INTERACTION PROCESS AND PERSPECTIVES FOR SITEX

The above-presented decision-making process, including the public participation process, has enabled to

- conceive and implement a step-by-step process for the closure of the Asse II mine with a common agreement of the territorial stakeholders and the responsible institutions (BfS, BMU, BMBU and NMU);
- share a common assessment of the situation with the territorial stakeholders through a commonly agreed framework for the assessment of the 3 main options (backfilling, waste retrieval or internal relocation of waste packages);
- make a commonly agreed choice in favour of waste retrieval;
- reconstruct and safeguard trust in the assessment and decision process;
- develop the capacity of territorial stakeholders to understand and assess highly technical issues.

6.2.7 Pluralistic expert group on radioecology in Nord-Cotentin (France, 1997-2010)

6.2.7.1 ORIGINS AND JUSTIFICATION OF INTERACTIONS BETWEEN TSOS AND CIVIL SOCIETY

The Pluralistic expert group on radioecology in Nord-Cotentin (Groupe Radioécologie Nord-Cotentin – GRNC) was developed between 1997 and 2010 in a sensitive context of national controversies and local actors concerns following the publication of epidemiological studies in 1995 and 1997. These studies identified excess of leukaemia in the canton of Beaumont-La Hague and suggested a causal relation between the development of leukaemia in children in the region and exposure due to radioactive discharges from the various nuclear installations (notably the reprocessing plant in La Hague) located in the Cotentin peninsula.
In February 1997, the Ministries in charge of Environment and Health set up a Scientific Committee in order to propose a new epidemiological study in the Nord-Cotentin department (which includes the canton of Beaumont-La Hague). The Scientific Committee carried out its work from February to July 1997 with two sub-working groups respectively focusing on epidemiological aspects and radioecological aspects. As regards radioecological aspects, the Scientific Committee recommended that, for transparency purposes, the contents of the models of discharge transfer through the environment had to be clarified and their forecasts compared with measurements made in the environment. It was found that a pluralist expertise was necessary to confirm confidence in the results of such a critical evaluation process.
In August 1997, Annie Sugier, from the Institute for Protection and Nuclear Safety (IPSN) was given mandate Ministry of Environment to continue radioecological works. Upon Mrs Augier's request, the expert group was widened to include local and national NGO experts as well as foreign experts. From this point, the expert group was referred to as the GRNC.
The GRNC has pursued two objectives between 1997 and 2000:

- To reconstitute environmental and medical expositions to radiation (from natural and artificial sources) for the population possibly affected by discharges of Nord-

Cotentin nuclear facilities and assess leukaemia risks associated to these expositions;

- To answer the request of the Ministry of Ecology to provide elements of expertise in the perspective of updating the regulations ruling the operation of the COGEMA La Hague reprocessing plant.

In this process, the main rationales for engaging with the civil society were to take maximum account of local concerns (in particular concerning health of the children) and to ensure transparency of debates and credibility of the expertise process in a context of controversies.
Following the first mission of the GRNC, its mission have been continued and updated twice: a first time from 2000 to 2002 and a second time from 2004 to 2010. The present case study focuses on the first mission of the GRNC from 1997 to 2000.

6.2.7.2 ORGANISATION OF THE INTERACTION PROCESS

The GRNC has included more than fifty experts from very different backgrounds (see precise composition in the following subsection).
The GRNC was structured along one plenary group gathering all members, which convened about 20 times from 1997 to 2000, and four thematic working groups focusing on the following themes:

- critical examination of discharges,
- gathering and interpretation of environmental measurements performed by the participants,
- comparison of models for exposure assessment,
- dose assessment.

From the beginning of the works of the GRNC, it was agreed between its members that the objective of the group was not necessarily to lead to a consensus, but to perform the most exhaustive possible critical analysis emphasizing uncertainties and points of disagreement between experts whenever necessary. As a consequence, possible disagreement points were explicitly exposed in the reports produced by the GRNC.

6.2.7.3 IMPLEMENTATION OF INTERACTION

The GRNC was composed of experts from a wide range of organisations (including civil society organisations):

- experts from public organisations of expertise and control,
- nuclear operators in Nord-Cotentin,
- members of the Local Information Commission attached to La Hague Reprocessing Plant (CSPI),
- three NGOs (ACRO, CRII-RAD, GSIEN) with expertise skills and, for two of them, measurement capacities,

- other French non-institutional laboratories (CEPN, University of Montbéliard, Analysis Laboratory of La Manche),
- Foreign organisations: NRPB (UK), BfS (Germany), OFSP (Switzerland).

The choice of experts was made by the President of the GRNC (Annie Sugier) with the agreement of the Ministry of Ecology. The option of including experts from NGOs and from foreign organisations was proposed by the President of the GRNC and validated by the Ministry of Ecology.
All the members of the GRNC were participating to the meetings with an equal standing. However, a discrepancy of resources (human resources and money) remained between NGOs and operators or institutions.
As regards the organisation of the expertise process and its pluralistic character, the GRNC constituted an innovation compared to previous pluralistic expertise processes insofar as pluralistic expertise was performed not only in thematic sub-working groups but also in the plenary group of GRNC.

6.2.7.4 ACCESS OF CIVIL SOCIETY ACTORS TO INFORMATION

As concerns access of the members of the GRNC to information, all documents and elements of information were shared within the whole group. Moreover, all GRNC activities were made traceable through detailed minutes of all meetings.
As regards access to external actors to information, the rule of operation of the GRNC did not set any obligation of confidentiality to its members. Any member of the GRNC had full freedom to use GRNC documents, including minutes of the meetings, for external communications.
Particular attention was paid to local organisations having an interest in the works of the GRNC (for instance the "Angry Mothers" group – "Les mères en colère"), who were kept informed of the progress made by the group on a regular basis.
The Local Commission of Information attached to the reprocessing plant of La Hague (CSPI La Hague) also constituted a tool for transparency and information sharing, as it plays a role of local dialogue forum on nuclear activities of the La Hague site. In effect, members of the CSPI were included into the GRNC and were thus able to report the progress of the works during the meeting of the CSPI. Moreover, several presentations of the progress were organised before the CSPI with presence of observers and media.
Finally, the conclusions of the works of the GRNC were made available to the public on the Internet at the sae time as they were sent to the Ministry of the Environment and to the Secretary of State for Health (on 7th July 1999).

6.2.7.5 OUTCOMES

Broadening of the GRNC beyond the traditional framework of discussions between operators and representatives of expertise organizations has contributed to improving the quality and credibility of the work. For instance, the presence of NGOs having a good knowledge of the territory and of the local ways of life led to better defining the reference groups and exposition scenarios, making them more consistent to local lifestyles and food consumption patterns as a result of the presence of NGOs. The presence of representatives of NGOs and foreign experts has also enriched the work by adding complementary skills and sensitivities essential for a critical analysis

The composition, missions and rules of operation enabled the NGOs to "open the black boxes" of expertise (e.g. modelling, assumptions…). The joint work over several years and the presence of sometimes very different points of views has enabled the members of the GRNC in reaching a better understanding of each other's logic and values, and eventually contributed to a better mutual understanding.
The GRNC did not succeed to find definite explanations of the higher incidence of leukaemia. Therefore, recommendations were made for deepening some aspects of exposition assessment and risk assessment.
Finally, the GRNC constituted a reference in the French context and has thus contributed to evolutions of the system of surveillance and control of nuclear activities towards in two ways:

- Estimating dosimetric impact from the point of view of populations actually exposed to a set of installations and activities, thus putting different risks into perspective;
- Developing openness to society in the field of surveillance and control of nuclear activities.

The usefulness of this tool in the Nord-Cotentin context was recognised both by local actors and public authorities. The GRNC has thus been reformed and adapted with new missions twice: a first time from 2000 to 2002 and a third time from 2004 to 2010.

7 Conclusions

Since the 1990s, in the field of hazardous activities in general and in the nuclear field in particular, a general trend of evolution has developed in Europe towards reinforced information and participation of the public to decision-making processes and towards more inclusive governance frameworks. In the nuclear field, the relationships between expert organisations, in particular technical safety organisations (TSOs), and civil society appears of key importance for developing access of the public to information and participation of the public to decision-making processes (as required by the Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters).
Various processes of interaction between experts and civil society have thus developed in Europe since the mid-1990's, involving different types of experts: institutional experts (TSOs), civil society experts, independent experts (university, foreign experts not engaged in the national context…).
The investigated case studies relate to various processes involving interactions between experts in the nuclear field and civil society actors at the local, national and supranational level. They are mainly situated in the field of RWM but also include cases related to implementation of innovative processes of interaction in other fields of nuclear activities.
Emerging from the above assessment, a transversal analysis shows how processes of interactions between experts and civil society contribute to longer-term evolutions of the governance of radioactive waste management and nuclear activities more generally.

Origins and justification of interactions between TSOs and civil society

The interaction processes that were studied through the considered cases had various origins and triggers:

- For some of these processes, a crisis has been at the origin of the experimentation of new relationships between experts and stakeholders (e.g. in the case of the citizen advisory group for the closure of the Asse II repository and in the case of the GNRC). In the case of CoRWM, it was the failure of the UK national decision-making process for radioactive waste management that led to test new approaches.
- In other cases, the interaction processes were implemented in the framework of European research projects (ARGONA and COWAM in Practice) in order to experiment new types of interactions between various stakeholders in the context of radioactive waste management. These processes have also aimed to open safe spaces for dialogue that developed in parallel with formal decision-making processes. In these contexts, interaction processes were initiated and implemented either by a TSO, or by experts or researchers working in the field of governance of radioactive waste management.
- Finally, in the case of the IRSN's strategy of openness to society and in the case of the cooperation between the IRSN, the CLI and the ANCCLI for the third decennial safety reviews, new modes of interaction between experts and civil society resulted from a bilateral decision of the TSO and the CSO, outside of any crisis context and within an institutional framework where the independence of the TSO was strongly asserted.

<u>Organisation of the interaction process</u>

The considered interaction processes were of variable duration, from one day (for each of the three interaction processes organized in the framework of the ARGONA project) to several years (it is the case of the GRNC, of the citizen advisory group related to the closure of Asse II repository, or of the IRSN's strategy of openness to society).

As regards the way these interactions were organised, the presence of an independent facilitator or mediator has been an important factor for securing the space for interactions and ensuring equitable participation in a heterogeneous group of actors. The use of structured dialogue methods can also be a facilitating factor for these interactions.

The role of civil society actors within these processes was most often:

- to benefit from different sources of expertise available in order to enhance their skills and capacity for action (panels citizens of CoRWM are an exception, insofar as the method to select citizens participating in panels specifically aimed to exclude actors actively engaged in the field of RWM);
- to voice their concerns and values and to make them taken into account by processes of expertise

- and also to contribute to a reformulation of the considered issues, to the quality of expertise or even to contribute to the expertise process itself (e.g. in the GRNC case).

TSOs played different roles in the studied interaction processes: they were initiators or implementers of some processes, providers of information and expertise or support to investigations led by stakeholders. In some processes (e.g. the closure of the Asse II repository or the national stakeholders groups in CIP), TSOs themselves were stakeholders in a multi-stakeholder process.

Implementation of interaction

Regarding the development of expertise, most of the considered interaction processes have involved not only institutional experts and civil society actors, but also a diversified set of experts (regulators, TSOs, academics, foreign experts, experts from civil society…). Three kinds of positions for experts can be identified in the different case studies:

- experts involved in the institutional context (operators, TSO, regulators),
- independent experts (e.g. academics and foreign experts - including experts from institutional foreign organizations not involved in the national framework as in the case of GRNC)
- and experts from NGOs or close to civil society. The participation of civil society actors in the process of identification and selection of experts is a factor that increases the reliability of the interaction processes from the point of view of civil society.

In the considered interaction processes, the diversity of expertise sources has been an important condition for developing trust of civil society actors in the process and its results. In particular, experts from NGOs and experts close to civil society play a special role of "technical mediation" between institutional actors and civil society. In effect, they reliably perform a work of interface for civil society actors, thus translating issues, challenges and concerns of society actors into scientific and technical elements that can be treated by expertise processes. Conversely, they facilitate the "decoding" by civil society actors, of the issues, assumptions and presuppositions that are explicitly or implicitly integrated in the expertise processes.

Outcomes of the interaction processes

In the considered cases, interactions between civil society and experts have led to outcomes of four different types: improvement of expertise, improvement of decision-making, competence building and access of civil society actors to information.

As regards improvement of expertise, the interaction processes have led in different cases to an improvement of the quality of the expertise process and its results (e.g. better definition of reference groups, of exposure scenario taking into account local ways of life). This includes development of new processes and methods for performing expertise with local actors and civil society. Interactions between experts and civil society also improved trustworthiness of the results of the expertise process, in particular in cases where experts of various backgrounds and sensitivities are involved in the expertise process.

As regards improvement of decision-making, the interaction between experts, decision-takers and civil society has led in different cases to improve the quality and trustworthiness of the decision-making process. This includes identification of commonly agreed solution between civil society, local actors and decision-makers but also adaptation of the decision-making process to allow the different stakeholders to contribute to the quality of decisions. This also include the development of better mutual understanding between experts and decision-makers on the one hand and local actors and civil society actors on the other hand, notably the development of a common language between the different involved stakeholders.

Very often, the considered interactions between experts and civil society have contributed to reinforce skills of the considered actors. On the one hand, local actors and civil society actors have developed their capacity to address technical issues in connection with issues and questions of prime relevance for local actors and civil society and to become permanent actors in these issues. On the other hand, TSOs and experts have also developed their capacity to interact in a relevant and fruitful way with local actors and civil society.

Finally, these interaction processes have most often resulted in a better access to information of local actors and civil society actors, in connection with their questions and needs. In particular, the work of technical mediation carried out by experts from NGOs and experts close to civil society appears in particular as a key factor for fostering effective access of civil society to information on issues such as radioactive waste management, which involve a high degree of technicality.

Contribution to a longer-term evolution of governance: interaction processes as “change incubators”

Taking a step back and looking beyond the strict scope of the various interaction processes, we can see that they almost all fit in a longer-term process of evolution of the governance of radioactive waste management (and also of nuclear activities in general) towards a greater openness to different stakeholders, especially civil society. This process is a long-term process of co-evolution between expert bodies and civil society (in the case of the IRSN strategy of openness to society, the interaction process is itself a process of co-evolution in the long term, which involved broader developments impacting governance of nuclear activities as a whole in the French context).

In this process of co-evolution over a long time, the interaction processes between experts and civil society, limited in time, space and in the scope of considered issues, can be considered as "change incubators". Indeed, they open, usually off the usual system of governance, a bounded space where the different actors (especially civil society actors and TSO) can safely experiment with new types of interactions and enter in a process of collective learning. If favourable conditions are met, the improved mutual understanding of actors, the experimentation of new roles and the new formulation of issues resulting from the interactions may contribute to changes in longer-term relationships and mutual positions of the actors, which contribute to a process of longer-term evolution of the governance of radioactive waste management (and, more generally, nuclear activities).

TSOs contribute to this process of co-evolution in different ways, including:

- Supporting engagement of civil society actors and strengthening their skills in the framework of interaction processes that play a role of change incubators, or initiating themselves such processes;
- Adapting their culture and practices to accommodate the active contributions of civil society as an added value to the quality of safety, expertise and decisions;
- Directly supporting an autonomous, continuous and long-term process in which civil society develops skills, capacity to engage in issues of public interest, networking capacities.

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