International Perspective in Radioactive Waste Management

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Overview of presentation

- Part I - The OECD and the NEA

- Part II – RADWASTE: a review of developments, expectations as expressed to us and covering 2008-2009

- Part III - FINAL OBSERVATIONS
The Organisation for Economic Co-operation and Development (OECD) - Strategic Objectives

- Promote sustainable *economic growth*, *financial stability* and structural adjustment
- Improve *human capital* and *social cohesion*, and promote a sustainable environment
- Contribute to *shaping globalisation* through the expansion of trade and investment
- Enhance public and private sector *governance*
- Contribute to the development of *non-member economies*
### The 30 OECD Members and Year of Entry

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<th>Country</th>
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<tr>
<td>Australia</td>
<td>1971</td>
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<td>Austria</td>
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<td>Slovak Republic</td>
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The OECD Nuclear Energy Agency (NEA)

- 28 countries: all the OECD countries except New Zealand and Poland

• To assist its member countries ... the scientific, technological and legal bases required for the use of nuclear energy

• To provide authoritative assessments and to forge common understanding on key issues, as input to government decisions on nuclear energy policy, and as input to broader OECD policy analyses
Nuclear Share in Electricity Generation of OECD Countries in 2004 (%)

- The Netherlands: 3.8%
- Mexico: 4.2%
- Canada: 15.1%
- United States: 20%
- United Kingdom: 20.4%
- Spain: 22.7%
- Finland: 26.5%
- Japan: 29.8%
- Germany: 30.1%
- Czech Republic: 31.8%
- Republic of Korea: 38%
- Hungary: 38.5%
- Switzerland: 39.4%
- Sweden: 50.5%
- Belgium: 55.2%
- Slovak Republic: 55.5%
- France: 78.1%

OECD average: ~ 24%

Source: NEA 2005
Management of Radioactive Waste and Materials - Goal

Assist members in the area of management of radioactive waste and materials, focusing on the development of strategies for the safe, sustainable and broadly acceptable management of all types of radioactive waste, and in particular long-lived waste, and spent fuel.
RF-Workshop Indications on International Guidance – some findings

• International guidance is interpreted in different ways in each country, there is still a need for clarification of fundamental terms such as “undue burden” or “safety”

• Reasonable consensus on fundamental objectives, but much less consensus on practicable criteria: e.g. how to demonstrate the provision of safety for people living in the distant future

• The debate about how to protect people and the environment in the far future on the same safety level as at present is still going on.
RF-Workshop Indications on long times frames for protection

• More discussion is needed on time cut-offs for compliance and weighting short term protection vs. long term protection

• There is a growing consensus to introduce different time periods, and to use of dose and risks as *indicators* of protection in the long term. Particularly the use of these indicators and how they should be interpreted, and considering limitation on accuracy and reliability, should be clearly communicated
Milestones, Developments and trends in NEA Member Countries

(data from March 2008 to March 2009)

From March 2009 meeting of RWMC
Korea

- Plans for a national debate to determine the policy for the management of SF.
- The full operation of a new LILW disposal center foreseen in 2010.
- A new dry storage facility for (CANDU) SF beginning in 2009.
- Changes in the fuel cycle in terms of enrichment and burn-up, along with a detailed database on SF inventory and characteristics and a very active research programme, supporting the development of geological disposal for HLW.
- Decommissioning activities and management of the resulting waste
Milestones and Developments (1)

- Licensing, expansion and re-licensing of LILW waste disposal facilities: Czech Republic, Hungary, Spain, US
- Licensing of NORM disposal facility in Norway
- New or re-organized regulatory bodies in several countries: Italy, Sweden, Switzerland
- Framework and first steps taken for step-wise, voluntary siting process for geological repositories: Switzerland, UK
- Six siting regions for repositories announced in Switzerland. First step to be completed in 2011.
- Update regulatory policy for SF repository in Finland, and a new plan for the preparation of the licensing Safety Case (Safety Case Plan 2008).
- Final safety regulations and license application for Yucca Mountain, US
Milestones and Developments (2)

- Expressions received (by March 2009) from three local authorities in West Cumbria, UK, to start discussions on deep repository siting/hosting
- Expressions of interest for hosting long-lived LLW disposal facility in France - Government decision expected in June 2009 on preferred candidate sites
- License application for centralized storage facility in Slovak Republic
- New laws and major regulatory changes in Spain related to environmental impacts, safety of all nuclear installations, and requirements on waste storage facilities
Expected Events in 2009 (1)

- Site selection for HLW geological repository in Sweden
- Final safety regulations for HLW disposal in Germany
- Proposal of siting process for implementation of HLW repository in Canada
- Re-start site characterization processes for HLW repository in Czech Republic
- Start of national dialogue for HLW repository in Belgium
- Designation of 2-3 sites for further investigation for long-lived LLW disposal facility in France - Difficulty has been encountered
- Dialogue workshop in the HLW repository area (NEA); Designation of a “zone of interest” for HLW repository in France (from 250 to 30 Km-sq);
ZONE D’INTÉRÊT POUR UNE RECONNAISSANCE APPROFONDIE (ZIRA)

Le CLIS souhaite mettre à la disposition du grand public les derniers éléments d’information concernant la démarche de l’ANDRA pour déterminer les ZIRA (Zone d’Intérêt pour une Reconnaissance Approfondie) de 30 km². Des études complémentaires y seront mises en œuvre avant de proposer la localisation exacte du stockage, si celui-ci est décidé. La démarche a été présentée aux élus concernés et aux acteurs socio-économiques des départements de la Meuse et de la Haute-Marne, ainsi qu’aux membres de la commission « Localisation » mise en place par le CLIS (voir p. 4).

Les critères qui ont permis de définir la zone de consuation rencontrée (partie blanche) sont géologiques (profondeur et épaisseur de la couche d’argile, éloignement des failles régionales) et hydrauliques.

Les ZIRA ont été implantées dans ce périmètre en tenant compte de contraintes de surface retenues par l’ANDRA après rencontre avec les élus :
- superficie d’au moins 200 hectares en continu,
- éloignement des zones habitables,
- implantation sous les forêts,
- infrastructures de transport (routes, voies ferrées et navigables),
- zones minérales,
- périmètres de captage des eaux,
- zones Fautura 2000,
- monuments historiques ou classés,
- zones administratives militaires.

Le CLIS sera attentif à ce que la ou les ZIRA proposées par l’ANDRA au gouvernement (dici l’automne 2008) répondent à tous les critères de sûreté à long terme, et plus spécialement les critères géologiques.

L’ANDRA envisage deux zones en surface, l’une à la verticale du centre de stockage, l’autre pouvant être éloignée de 5 km maximum, avec une distance d’au moins 10 km. Ces zones pourraient souffler, notamment, les installations souterraines et de surface.
Expected Events in 2009 (2)

- Announcement of site selection process for a centralized SF storage facility in Spain
- Development of national strategy for all types of RW in Poland
- Continuation of process for expressions of interest for UK geological repository
- Further information on path forward for HLW repository in US
- Application for renewal of the license/certification for operation of WIPP TRU repository in US
- Preparation of license application for LLW in Belgium (to be submitted in 2011)
- 3rd Meeting of the Joint Convention (May 2009)
Trends (1)

- Expansion of nuclear power and “new build”
- National waste management plans
- Clarifying the regulatory framework
Trends (2)

- Conceptualisation and implementation of “volunteer” siting strategies
- Vigorous efforts at public information and dialogue to encourage participation by municipalities and regions in siting processes
Trends (3)

Meanwhile…..

- Development and expansion of interim SF storage facilities, both on-site at NPPs and centralised

- Reviewing and updating funding schemes to ensure sufficient financing for eventual disposal
Trends (4)

- Waste conditioning and treatment seems to be a higher priority

- Methods to reduce quantities of conditioned waste sent for long-term storage and disposal
Challenges (1)

- Pending Political Decisions
- Organizational Evolution or Transition
Challenges (2)

- Continued Need for Storage
- Waste Disposal Capacity Limitations
- Legacy Site and Historic Waste
Challenges (3)

- Building technical capacity and retaining qualified personnel
- Integration of information and knowledge management
- Societal dialogue and public acceptance
Geological disposal

Key messages from NEA RWMC (collective statement)
KEY MESSAGES

- Storage is being implemented successfully, but it is no substitute for waste disposal.
- There are no miracle solutions that would eliminate the need for final disposal.
- Geologic disposal is technically feasible and affords unparalleled protection.
- Satisfactory safety cases to support decision making are a working reality.
- The experience and data from RD&D is wide and pertinent.
KEY MESSAGES

◆ An international framework (ICRP, IAEA) exists for achieving an appropriate level of protection

◆ First step in the strategy for ultimate WM (disposal) is the definition of a national energy policy that addresses the role of nuclear power and in which the waste arisings are recognised

◆ Need for national plan with a vision for the final management of all types of radioactive wastes

◆ Decisions need to be prepared with stakeholder involvement and taken sequentially. Long implementation times are both challenge and opportunity.
KEY MESSAGES

◆ Retrievability and reversibility need to be defined in each national program

◆ What works in one country may not be as effective in another

◆ Cultural, societal, and geographical similarities and differences have resulted in a variety of paths, but common safety and security objectives underlie these paths in national waste management solutions
OVERALL: RADIOACTIVE WASTE MANAGEMENT AND DECOMMISSIONING (1)

- Cannot be considered as being solely a technical issues to be resolved solely by technical specialists

- Failure to recognize this has led to significant delays in waste management and in some decommissioning programmes
.. And GEOLOGICAL DISPOSAL

◆ ...is moving forward...

◆ ...but progress needs to be consolidated... a “wait and see strategy” is contrary to safety and ethics

◆ ... take stepwise decision making seriously ...in most countries, regional levels are nowadays as important as national levels