SITEX

SUSTAINABLE NETWORK FOR INDEPENDENT TECHNICAL EXPERTISE OF RADIOACTIVE WASTE DISPOSAL

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Frank Lemy – WP2 leader (FANC)
Decision Making Process

End users = SOCIETY

Regulatory expectations & needs

Support for regulatory decision

Implementing function

Expertise function

Regulatory function

Compliance demonstration

Technical dialogue

Sustainable network of Independent Technical Expertise

Radioactive Waste Disposal

Objectives

✔ To set the conditions and necessary means (TOR) for establishing a coordinated European (and possibly international) workforce ensuring a sustainable capability to provide a technical and independent expertise in the field of radwaste management safety and radiological protection,
  - Why is it important to develop an expertise function on RWM safety at national level? What is its role?
  - What are the expectations of national RWM regulators, the public, vis-à-vis a national expertise function? Its independence? expertise needs?
✔ Areas foreseen: harmonization, optimisation of resources (R&D), training, involvement of stakeholders in decision making process
✔ CA; December 2011 – December 2013
✔ [http://sitexproject.eu/](http://sitexproject.eu/)
SITEX Cartography

End users = SOCIETY

EXCHANGE MEETINGS

IGD TP
INSOTEC
IPPA

WORKSHOP

ENSTTI
MUTADIS

FANC
ASN
SSM
ENSI
CNSC
ELI

IRSN
GRS
UJV
BelV
LEI
DECOM
NRG

External Expert Advisory Board
IAEA
NEA
USEPA
STUK

• A description of the **considered functions of the future European network of assessors**

**Harmonization**
- Opportunities for the harmonisation of the review methods and make as far as possible the expertise function consistent through the member countries

**Training**
- Source of harmonization of professional skills & profiles of expertise, by providing more exchanges between experts and complementary training to the existing national and international programmes

**Research & Development**
- Way to develop synergies among national organisations in order to reinforce safety, optimise the use of available resources and contribute to the harmonization and sharing of practices of research and results.
SITEX WP2: Regulatory Expectations & Needs
WP2 Objective

To set up the conditions for allowing mutual understanding between National Safety Authorities (NSAs), Technical Safety Organisations (TSOs) and Waste Management Organisations (WMOs)
Interactions Between Regulatory, Expertise and Implementation Functions

Regulatory function

WP2.1

Regulatory expectations & needs

Support for regulatory decision

Expertise function

WP2.2

Implementing function

Compliance demonstration

Technical dialogue

End users = SOCIETY

WP2.1

Regulatory expectations
## WP2 Participants

<table>
<thead>
<tr>
<th>Organisations</th>
<th>Type</th>
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<tr>
<td>IRSN (FR)</td>
<td>TSO</td>
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<tr>
<td>GRS (DE)</td>
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<td>MUTADIS (FR)</td>
<td>Other</td>
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WP2.1 : Needs for Technical Guidance
Requirement 2 of IAEA SSR-5:
The regulatory body shall a.o.:

- establish **regulatory requirements** for the development of different types of disposal facility for radioactive waste
- undertake **international cooperation**, as necessary, to fulfil its regulatory functions
- provide **guidance** on:
  - the interpretation of the national legislation and regulatory requirements *as necessary*
  - what is expected of the operator
WP2.1 Objective

Identification of the areas where development and harmonization of technical guidance is needed in priority
WP2.1 Deliverable

- **Title**: “Overview of existing technical guides and further development”
- **Description**: An overview of existing technical guides including an identification of:
  - common points and differences
  - the needs for further development, harmonization and dialogue
WP2.1 Working Hypotheses (1/2)

Safety requirements on which international consensus exists are taken as reference:

• **EC Directive** on SF & Radioactive Waste Management (2011/70/Euratom)
• Draft **WENRA Safety Reference Levels** (SRLs)
  – Set of requirements against which the situation of each country is assessed
  – Engagement to transpose SRLs into national regulatory frameworks of WENRA member states
• **IAEA Safety Fundamentals and Requirements**
• **ICRP** recommendations
WP2.1 Working Hypotheses (2/2)

Technical guidance:

• associated with one or several safety requirements

• may serve different purposes:
  – Interpretation of requirements
  – Explanation of how requirements can be met in practice and/or how compliance should be substantiated
  – Facilitate dialogue and interactions with the public or with other stakeholders

• possible audiences: implementers, experts fulfilling an expertise or a regulatory functions, public or other stakeholders
WP2.1 Inputs

- Safety requirements (WENRA, IAEA, ...)
- Existing regulatory guides
- A priori identification of development needs
- Exchanges with IGD-TP & other stakeholders
- IGD-TP vision

WP2.1 Steps

- Safety Issues Topic List
- Overview of existing regulatory guides
- Common points & differences
- Needs for further development, harmonization and dialogue
- Identification of the areas where technical guidance and dialogue are needed in priority
Safety Issues (1/4)

Safety issues identified based on existing “high-level” safety requirements:

• **Governing principles:**
  – Radiation protection principles
  – Protection of present and future generations
  – Defence in Depth & Robustness
  – Demonstrability & Feasibility
  – ...

• **Safety strategy:**
  – “High-level approach for achieving safe disposal”
  – addresses the implementation of the “governing principles”
Safety Issues (2/4)

- **Management system:**
  - Organisational structure
  - Resources
  - Process implementation (including QA included)
  - ...
Safety Issues (3/4)

- Site selection
- Design
- Construction
- Operation
- Closure & Decommissioning
- Period after closure and institutional controls

Requirements associated with specific phase(s) of repository development

- Waste acceptance
- Monitoring
Safety Issues (4/4)

- **Safety case and assessment:**
  - Objectives and scope, Graded approach, SC/SA content vs. regulatory decision steps
  - Characterisation, knowledge and system understanding
  - SA methodologies, approaches & tools:
    - Timescales and timeframes, uncertainties, deterministic vs. probabilistic approaches, scenario development, models,…
  - Indicators & criteria
  - Operational safety assessment
  - Long-term safety assessment
  - Periodic safety review
  - Independent verification
Safety Issues vs. Requirements

<table>
<thead>
<tr>
<th>SAFETY ISSUE</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>SAFETY ISSUE</td>
<td>WENRA SRLs</td>
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<tr>
<td>SAFETY ISSUE</td>
<td>IAEA Principles &amp; Requirements</td>
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<td>SAFETY ISSUE</td>
<td>EC directive 2011/70/Euratom &amp; ICRP Recommendations</td>
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<td>SRL 4.1.9</td>
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<tr>
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<td>Article 7.3</td>
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Example: Requirements associated with the safety issue “Uncertainties”
Identification of the Needs of NSAs & TSOs

Needs of NSAs/TSOs for guidance development and/or dialogue are currently identified based on:

- Questionnaire on existing, used and needed guidance
- Comparison of existing technical guides

These needs will be prioritized considering the level of « urgency », importance for safety, the level of interest,...
Identification of WMOs’ Needs
(1/3)

What would be the most suitable way(s) of identifying the needs and priorities of WMOs?
Several topics identified and prioritized in the IGD-TP’s SRA 2011 & DP 2011-2016 are directly related to requirements and issues addressed in WP2.1, e.g.:

- **Topic 1.1**: Increase **confidence in, and testing** and further refinement of the **tools** (concepts, definition of scenarios and computer codes) used in safety assessment
- **Key Topic 3**: **Technical feasibility** and **long-term performance** of repository components
- **Topic 4.1**: Methodologies for **adaptation and optimisation** during the operational phase
- **Key Topic 6**: **Monitoring**
  - “Explicit or implicit repository monitoring requirements in regulatory and guidance framework”
- ...
Identification of WMOs’ Needs (3/3)

Would IGD-TP have an interest in answering a questionnaire on needed guidance?

Examples of questions that could be asked for each safety issue:

• Do you think it is necessary to develop or further develop guidance on this issue?

• Topics that should be covered in particular by the guidance

• Requirement(s) that should be addressed by the guidance

• Level of priority of this development?

• Should the guidance address specific programme phase(s)?

• …
WP2.2 : Needs for Expertise and Technical Support
WP2.2 Context

Requirement 2 of IAEA SSR-5:
The regulatory body shall a.o.:

• set **conditions** for the development, operation and closure of each individual disposal facility
• carry out such activities as are necessary to **ensure that the conditions are met**
• maintain **competent staff**
• acquire **capabilities for independent assessment**
• undertake **international cooperation**, as necessary, to fulfil its regulatory functions
WP2.2 Context

EC Directive 2011/70/Euratom (Article 8):
“Member States shall ensure that the national framework require all parties to make arrangements for education and training for their staff, as well as research and development activities to cover the needs of the national programme for spent fuel and radioactive waste management in order to obtain, maintain and to further develop necessary expertise and skills.”

= Prerequisite for ensuring effective independence of the regulatory (as required by Article 6-2)
WP2.2 Objective

Identification of the expertise and technical support needed by the regulatory function in order to perform an independent assessment of compliance with safety requirements
WP2.2 Deliverable

• **Title:** “Main key technical issues, expertise and support needed”

• **Description:** An identification of the:
  – main key technical issues that must be assessed by regulators at the different stages of the repository development
  – types of information, expertise and support needed at each stage of repository development
  – areas where expertise/support are needed in priority
Main WP2.2 Inputs

“High-level” safety requirements & issues identified in WP2.1
EPG report on the review of a SC
Answers to WP2.2 Questionnaire
Other relevant references (IAEA DS-355, GS-G-1.1,...)

Decisions & stages of a repository project development
Key technical issues that must be assessed by regulators
Types of expertise and support needed to verify compliance with requirements

Rationale?

For each stage: Expertise & Support types vs. Key Technical Issues
Types of Technical Support Needed

• **Technical reviews**

• **Inspections:**
  – Tests, measurements and direct observations:
    • Continuous/periodic vs. specific tests and measurements
  – Interviews with personnel of the operator and the contractor
  – Examinations of procedures, records and documentation

• **R&D:**
  – Desk studies to establish the state-of-the-art and to take benefits from existing R&D
  – Modelling and calculations e.g. to identify key parameters & uncertainties, assess the level of conservatism, verify results,…
  – Lab tests & in-situ experiments e.g. to characterize components, to increase knowledge in phenomenology,…
Conclusions

WP2 is mainly aimed at:

• **fostering mutual understanding and dialogue** between NSAs, TSOs and WMOs

=> input from IGD-TP/WMOs would be most welcome!

• **identifying and anticipating the needs** for technical guidance and support

• contributing to the definition of the **functions of the future expertise network** (WP6)
Contribution of WP2 to the Definition of the Functions of the Future Expertise Network

- Regulatory Expectations (WP2.1)
- Harmonization
- Training
- Expertise practices
- WMOs
- Technical guidance
- R&D
- Stakeholder involvement
- Peer review
- Sharing resources

Thank you for your attention!