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URF Network Roadmap

Roadmap for Developing a Geological Disposal Program

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URF Network Roadmap

- Idea for roadmap was formulated from discussions at the IAEA Workshop in Albuquerque, NM, 2014 and at the Annual IAEA URF Network Meeting in Daejeon November 17-21, 2014
- Roadmap has several uses:
 - Reach a consensus by the URF Network on the set of activities and technologies needed for repository development
 - Provide a vehicle to forecast training and workshop needs
 - Provides a framework to help plan and coordinate URF Network activities

URF Network Roadmap Report*

- Describe the different phases and activities in a repository development program for the disposal of HLW/SNF –
- Identify the links between research and development (R&D) conducted in URLs and the overall repository development program
- Describe the role of URLs in the development of new repository technologies and provide examples of these technologies

* IAEA-TECDOC-1755 (published in 2014): Planning and Design Considerations for Geological Repository Programmes of Radioactive Waste)

Repository Development Timeline

Concept Evaluation

Evaluate Disposal Concepts; FEPs;
Develop and Demonstrate
Technologies; Preliminary RD&D

Note:

*Stages and phases are not necessarily discrete but often overlap
Stages and phases are typically iterative and not simply sequential
Stages and phases can differ from country to country*

Site Selection

Elicitation of
Interested
Host
Communities

Initial Site
Evaluation

Candidate
Sites
Evaluated

Preferred
Site Selected

Site Characterization

Characterization of
Selected
Site

Repository Development

Safety
Case/License
Application
Development
& Submittal

Construction
&
Monitoring

Operations
&
Monitoring

Closure

Generic RD&D

Site Specific RD&D

Site Characterization, Repository Design, Safety Evaluation

Repository Development Phases

Repository Development Program and its Major Activities

Major Development Phases	Planning, R&D, and Concept Evaluation	Site Selection: A consent-based process				Site Characterization	Repository Development			
	Major Activities	Elicitation of Interested Host Communities	Initial Site Evaluation	Candidate Sites Evaluated	Preferred Site Selected	Characterization of Selected Site	License Application	Construction and Monitoring	Operations and Monitoring	Closure
Management, Planning, and Project Implementation	Develop waste management policy				Communicate Updated Waste Management Plan and schedule, Site Selection Process, and opportunities/benefits to Stakeholders and communities	Communicate Updated Waste Management Plan and schedule, Site Characterization Process and Plan	Communicate and collaborate with stakeholders on final plans and schedules for detailed:			
	Establish institutional and legal framework	Establish working relationships with stakeholders and public	Engage and Establish working relationships with interested communities and stakeholders	Collaborate and communicate with communities on site evaluations	Communicate potential repository design and preliminary safety assessment	Communicate and collaborate with communities on characterization of site(s)	Site characterization			
	Develop waste management strategy and plan for achieving regulatory requirements including:	Enhance scientific and institutional credibility	Communicate Waste Management Plan, Siting Process, and opportunities/benefits to Stakeholders and communities	Collaborate with communities to conduct and understand environmental assessments	Communicate Site Characterization Plan and schedule	Engage and inform stakeholders and communities on progress of site characterization, repository design, transportation plan, preclosure safety, preclosure safety assessment, environmental impact assessment, and Safety Case	Repository design			
	High-level transportation and storage plan	Build awareness among communities of siting process, waste management plan, Safety Case, and opportunities/benefits	Respond to stakeholder and community concerns and inquiries	Collaborate with communities on the assessment of potential cultural, social, and economic impacts	Establish terms and conditions with communities offering to participate in the site characterization process		Preclosure Safety Assessment			
	High-level repository construction schedule	Identify communities interested in participating and learning more	Engage and communicate initial Site Evaluations	Collaborate with communities on evaluation of potentially suitable sites	Site Selected and endorsed by Government, stakeholders, and host and affected communities	Endorsement by the Government, stakeholders, and host and affected communities to proceed with the license application	Preclosure Safety Assessment			
	Safety Strategy		Identify communities with potentially suitable sites that offer to continue in the process	Identify communities with suitable sites that offer to continue to the next step	Assess the need and use of a site specific underground research laboratory	Submission of the License Application	Safety Case			
	Develop consent-based siting process						License Application			
	Establish baseline program schedule and costs						Endorsement of the License Application by the Government and stakeholders			
	Establish quality assurance program									
	Establish plan, structure, and schedule for Safety Case and License Application for Construction									
Planning	national and geological use of potential sites, volcanic and seismic hazard systems	Establish geological guidelines for suitable sites and host media	Using existing information and siting guidelines, conduct initial site evaluations using existing information and identify any potential issues that may obviate suitability of proposed sites	Develop Site Specific Draft Characterization Plans	Extensive field work begins to collect site specific data to develop geological, hydrogeological, geochemical, and thermal/mechanical/geotechnical models of the host rock and natural barrier system	Extensive field work begins to reduce uncertainty in site specific data and understanding of the following areas: geological, hydrogeological, geochemical, geotechnical, climatology	Geological models and geoscientific understanding of site has been confirmed, with acceptable residual uncertainty in host rock and geosphere parameter values and features, events, and processes (FICPs)	Establish criteria and investigations for evaluation and confirmation of siting areas	Monitor and confirm data and processes important to Post-Closure Safety	
	worldwide national and geological information	Develop Generic Site Characterization Plan and Budget: Phased approach with initial Site Investigations based on regional surveys and available information;		Conduct assessments of the effects on public health and safety and the environment of the site-characterization activities described in the draft site characterization plans	Identify location and extent of			Site investigations to collect data important to PA/Post-Closure		

Development Activities

Member A interested in this activity

Member A at beginning of their program

URF Member A

Time

Roadmap Report

The Need for a Roadmap – the Roadmap will help answer the following questions.

Where are we? The current understanding of how URFs support disposal will be summarized by presenting a Repository Development Timeline/Matrix

Where are we going? The URF Network wants to:

- Encourage the preservation, sharing and transfer of knowledge and technologies,
- Work on solutions for Member States currently without URFs,
- Supplement national efforts and promote public confidence in waste disposal schemes, and
- Contribute to the resolution of key technical issues.

How will we get there? Repository development phases and objectives, activities, and outcomes:

- Organize information to allow the URF Network to readily identify what solutions are and are not available
- Describe technologies and disposal concepts and their readiness for deployment
- Describe key technical issues that have been resolved and those that are outstanding
- A summary of URFs and technologies and the types of investigations and results that exist

The roadmap will be used to identify, prioritize, and plan future URF Activities