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Technical Status of the Programme for a Deep Geological Repository: A Regulatory View

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Scope

- Current technical status of the case for a geological repository;
- Some key attributes of a future post-closure safety case:
 - the need for broader safety arguments;
 - confidence building;
- Some key technical issues:
 - R & D: challenging technical problems;
 - development of a design;
 - link with current waste management activities.

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Where are we now?

- International and national experience;
- Confidence that a case could be made, **but we need**
 - a suitable site that is publicly acceptable;
 - more confidence in relation to specific scientific issues;
 - wider understanding of the approach to long-term safety assessment;
 - thinking in terms of how to avoid some of the more difficult issues.

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Regulatory Guidance (under revision)

- Dose constraint;
- Risk target;
- Optimisation (good science and engineering);
- Comparison with levels of radioactivity in the environment;
- Multiple factor safety case.

- Safety case is more than some numerical estimates:
 - understanding and confidence;
 - communication.

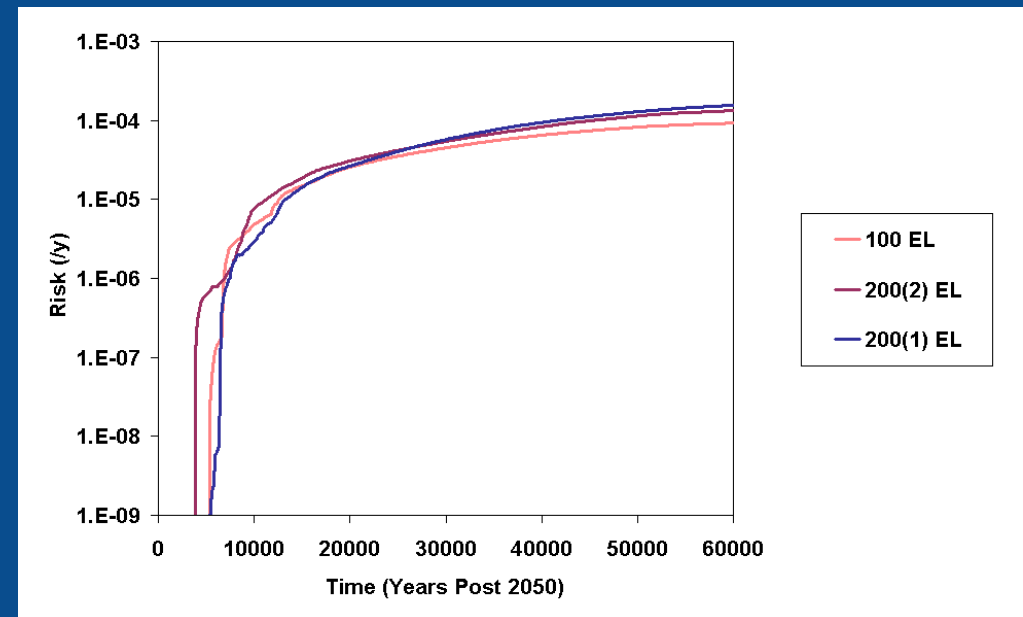
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Estimates of Consequence

- Range of barriers, processes and scenarios;
- Assessment and research models at different levels of detail;
- What is the right approach to use model outputs to help build a safety case.



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Building Confidence

- Validated and verified models;
- Alternative calculations;
- Range of performance indicators;
- Good science and engineering;
- Understanding and communication.



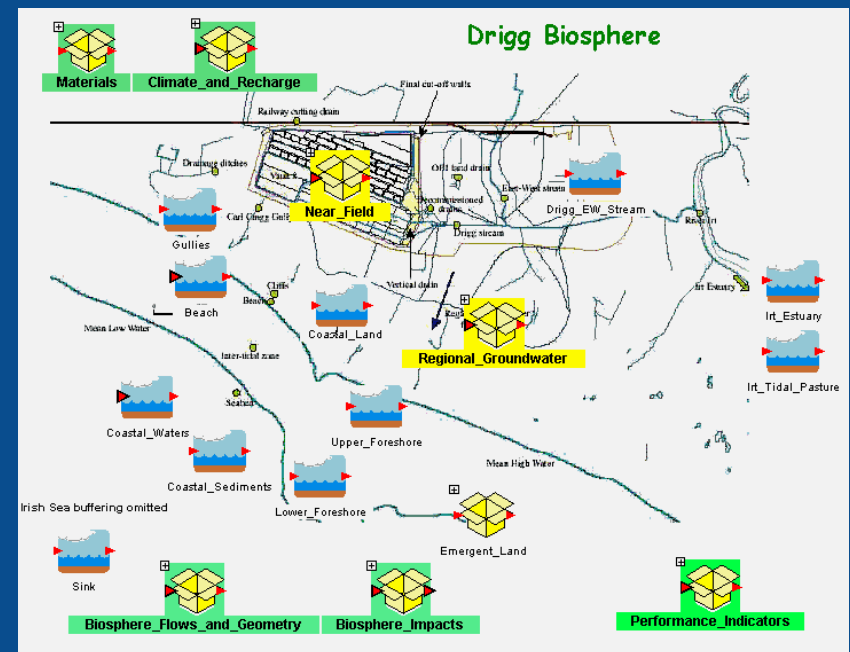
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Achievability

- Scope of assessment must be achievable;
- Where should the effort go?
- What sorts of models should be used?
- Effective co-ordination and management;
- How can issues be communicated?



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Current Research Priorities

- Challenging problems:
 - e.g. gas migration;
 - criticality;
- Issues that may be relevant to siting:
 - e.g. safety case for gas pathway in different geological environments;
- Issues that are relevant to waste conditioning and packaging:
 - e.g. alternative encapsulants or wasteforms;
 - package longevity.

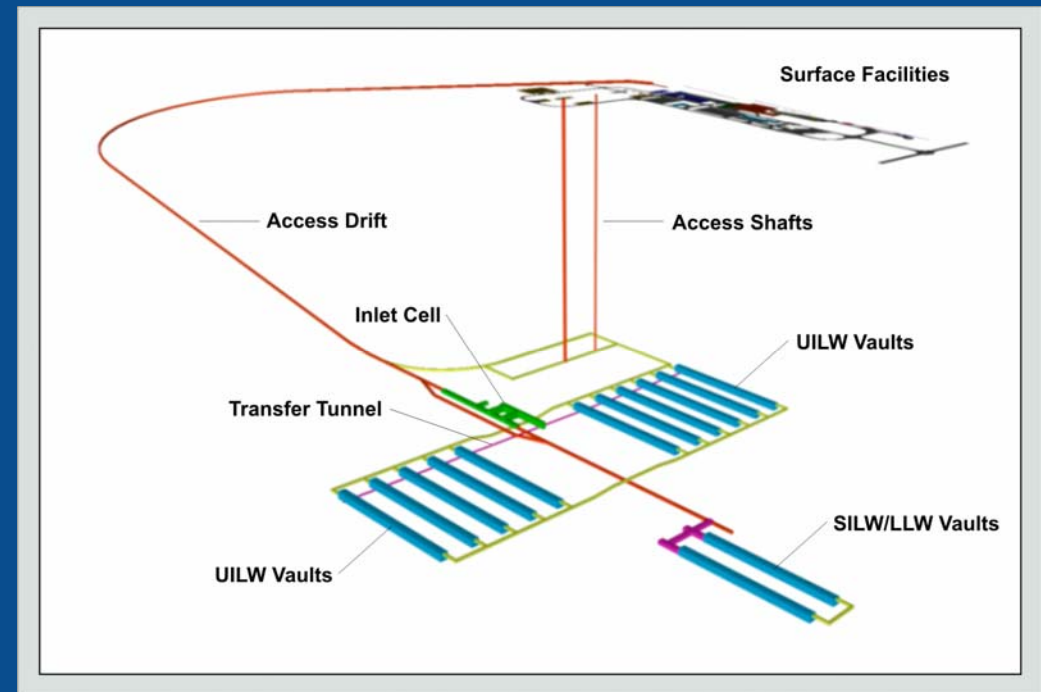
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Influences on Design

- Wastes have been and are being packaged;
- Siting opportunities and flexibility;
- Any requirement for retrievability;
- Performance;
- Predictability;
- Keeping options open?
- Timely to review position.



Courtesy of Nirex

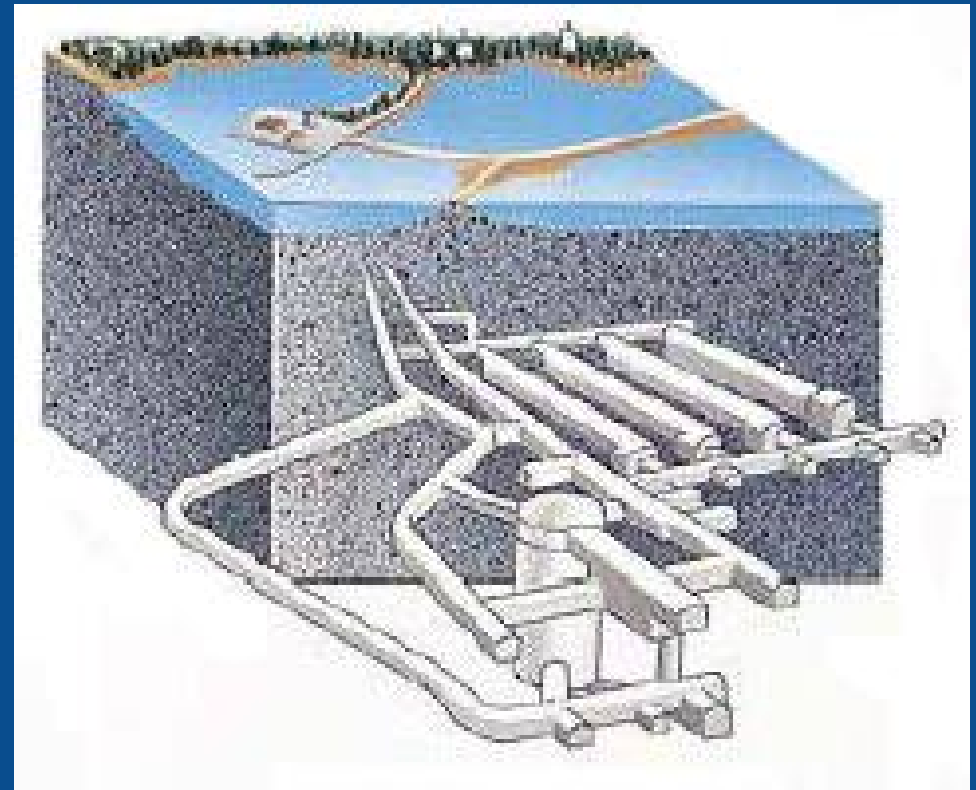
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Design Optimisation

- Need to understand the design options that are available at all stages;
- Understand reasons for design choices;
- Demonstrate good science and engineering;
- More comprehensive requirements if risks or doses are above target/constraint.



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Waste Management

- Nature of repository can be a strong influence on short-term waste management and packaging and conditioning;
- Package longevity;
- Gas producing wastes;
- Site clearance.



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Summary

- In our view, it is feasible to make a safety case for a deep geological repository for the UK inventory;
- Safety case is very much more than a numerical estimate of radiological consequence;
- A focused but substantial research programme is needed to support implementation;
- Need to review possible design options that are currently available taking account of all factors;
- Approach to waste disposal has important implications in terms of current waste management.