

PLANDIS: Introduction to Group Exercise ***Agenda Item # 11-13***

Charles McCombie
MCM-International

The research leading to these results has received funding from the European Union's European Atomic Energy Community's (Euratom) Seventh Framework programme FP7 (2007-2013) under grant agreements n°249396, SecIGD, and n°323260, SecIGD2.



Aims & Objectives of Group Exercise

To provide PLANDIS participants with the opportunity to:

- ▶ Gain experience of ranking a list of potential RD&D tasks of direct relevance to their stage of geological disposal programme*
- ▶ Meet other professionals working on RD&D prioritization in a disposal programme at a similar stage to their own
- ▶ Gain experience of completing the Guide template on RD&D prioritization to take away as useful input to own programme
- ▶ Interact with experienced RD&D planners in a more 'informal' setting to ask questions and provide feedback on Guide

**Attendees have been assigned to one of three groups:*

Group 1: Policy, Framework, and Programme Establishment;

Group 2: Generic Studies and Selection of Host Rock;

Group 3: Site Characterisation and Safety Assessment for Design



Overview of Groups

Everyone select the group that is most closely related to the stage of their own programme:

Group #	Phase Description	Relevance / Orientation	Room # / Group Leaders
1	Policy and Programme Establishment	Towards Programmes that have not yet established a geological disposal programme / mandated actors / first RD&D plan	Charles McCombie & Gunnar Buckau Room X
2	Generic Studies	Towards Programmes that have established a disposal programme but yet to decide on specific geology or approach to siting / deciding location	Ray Kowe & Daniela Diaconu Room Y
3	Geology-specific Studies / Surface-Based	Towards Programmes that have a siting strategy, are conducting site characterisation in a specific geology or surface based investigations	Jacques Delay & Steve Williams Room Z



General Overview of Group Exercise A (Item #12)

PART A (14:30 to 15:15 – 45 MINUTES):

- ▶ Each group will brainstorm a short list of key programme drivers or major activities that can influence how RD&D should be prioritized at their specific programme phase (15 minutes)
- ▶ Each group will then be presented with a pre-prepared list of possible RD&D tasks which they will rank in order of priority – rapporteurs will create a table and capture key considerations (30 minutes):
 1. What Programme Driver / activity the RD&D task is for, if any
 2. When do you need the information by (2, 5 or +10 years)
 3. What information is needed (knowledge gap)
 4. Significance of the RD&D task to overall programme (impact)
 5. How long the task will likely take and approximate costs



General Overview of Group Exercise B (Item #13)

PART B (15:30 to 16:30 – 60 MINUTES):

- ▶ Each person in each group will attempt to complete a more detailed task description (for one of the previously ranked tasks) using Template 2 of the Guide (blank paper copies provided - 10 minutes)
- ▶ Group leaders will ask participants to briefly report back to the group details from the completed task description and add key things to the ranked list previously developed in Part A (40 minutes)
- ▶ Everyone to provide general feedback on usability of the template from guide and suggestions for improvement (10 minutes)



House Rules of the Afternoon Sessions

- There are no right or wrong answers
- This is your chance to talk and ask questions (group leaders can help moderate, but discuss your ideas/questions with peers in the group who are at similar stage of programme)
- Don't need to all agree / achieve consensus (every programme will be slightly different)
- Stick to time slots, but you can take things away and email us afterwards to continue any important discussions or questions
- You don't need to take notes, the Guide will have appendix updated with key things from this session
- Have fun!



PLANDIS AGENDA # 12

DRAFT Slides for each Leader to present and use with their Group

Group 1: Policy and Programme Establishment

Charles McCombie & Gunnar Buckau

The following slides to be updated by CM and GB as appropriate ahead of PLANDIS



Select drivers important to RD&D plan for Policy and Programme and Establishment Phase:

Discuss and select a priority list, for example from:

- ▶ Developing Safety Case / Viability of Geological Disposal in Member State
- ▶ Generating Inventory / Waste Data
- ▶ Advice to NPPs (packaging / waste conditioning preferences)
- ▶ Stakeholder Concerns
- ▶ Gathering information for decision makers
- ▶ Interests of national Technical Support Organisations
- ▶ Opportunities of joint-programming (resource and cost savings)
- ▶ Skills and competence maintenance / development
- ▶ Regulatory requirement (s)

Key Drivers Selected – specifically what is needed for them?

1. Viability of Geological Disposal / Safety Case
2. Inventory
3. Advice to NPPs on compatible storage, conditioning and packaging options
4. Options assessments and costs
5. Regulatory Licensing needs



Rank and prioritise list of potential RD&D topics:

Possible RD&D topics for Policy and Programme Establishment Group to consider :

- ▶ *Characterisation of Spent Fuel (e.g. conditioning methods, corrosion rates)*
- ▶ *Development of spent fuel canisters (different material and designs in optimization (including costs) for the disposal concept(s))*
- ▶ *Development of triple-purpose spent fuel and HLW canisters (storage, transport and disposal) (especially important for LAP's where very long storage times can be considered)*
- ▶ *Characterisation of other wasteforms, in particular development of non-invasive characterization methods (e.g. conditioning methods, leach rates)*
- ▶ *Fracture rock modelling / groundwater flow modelling*
- ▶ *Develop canister emplacement technology*
- ▶ *Alternative buffer materials*
- ▶ *Participation in project at overseas URL*
- ▶ *Development of site characterisation technologies (seismic, boreholes, etc.)*



Rank and prioritise list of potential RD&D topics:

Possible RD&D topics for Policy and Programme Establishment Group to consider :

- ▶ *Review of repository concept options; selection of reference concept*
- ▶ *Develop understanding of microbes in the Waste, EDZ and Far-Field, in particular for LL and IL Waste*
- ▶ *Inventory: Development of scenarios and databases*
- ▶ *Develop thermodynamic database for solubility and sorption values*
- ▶ *Review and Assess Waste Storage Conditions and Treatment Options, in particular for very long storage times*
- ▶ *Establish methods and tools for High-level Safety Analyses*
- ▶ *Objectives and processes for involvement of stakeholders in view of developing an enduring partnership required for long-lasting projects, including drivers of and needs for the different stakeholders*
- ▶ *Research on effects of low level radiation on humans*



Prioritised List of RD&D Tasks: Group 1

Aim to complete high-level table like this (to be developed against Guide questions on p18 box) – Rank overall

Task Examples	1 Programme Driver?	2. Priority / Urgency (2, 5 or 10 years)?	3. Knowledge Gap?	4. Impact / Significance?	5. Timeframe to complete/ Cost
Review of available geological environments and potential screening / siting criteria	Options Assessments and Costs Viability of GD	High Urgency to current programme – needed to inform policy and impacts other tasks – like concept options	Comprehensive and robust review of international best practice, develop siting options / approaches	High impact to drivers listed and significance high	2 years minimum Could be done relatively quickly but need to consider associated stakeholder engagement activities High % of available budget
Development of model for Geosphere-Biosphere interface	No key driver for current Phase – very high level safety case / viability study required that could be completed without detailed G-B-G interface knowledge	Low Urgency (10+ yrs)	Low	Low Impact for current Phase - Consider review activity and possible participation in international project for competence development	Very Small % of available budget



PLANDIS AGENDA # 13

DRAFT Slides for each Leader to present and use with their Group

Group 1: Policy and Programme Establishment

Charles McCombie & Gunnar Buckau

The following slides to be updated by CM and GB as appropriate ahead of PLANDIS



Complete Template 2 for one Task

Template 2 RD&D Prioritization Scheme and Illustrative Task Description

T2.1 Description of the Main Drivers for RD&D in Current Phase of Programme

T2.2 List Identified RD&D Tasks and their Urgency (i.e. summarise what you need to know by when for each driver listed above). This should consider:

- *is it needed immediately (up to 1 year), 1-3 years, 3-5 years, or 5-10 years?*
- *is it a site-specific tasks that should be delayed to future programme phase?*
- *is it needed to underpin next safety case document(s) or next programme phase activity?*
- *is it needed to maintain skills, expertise and capability in an important topic?*
- *is it needed for strategic decisions at Nuclear Power Plants (e.g. packaging of waste)?*

T2.3 What is the Knowledge gap for each Task (i.e. what is the gap between current understanding and the knowledge that you need to improve, high/medium/low)? This should consider:

- *High: little relevant information exists*
- *Medium: Information exists, but there would be benefit in carrying out further work during the current phase of the programmes*
- *Low: there is a considerable body of relevant knowledge, which is largely sufficient for current phase of the programme*

T2.4 Assess the Impact of each RD&D Task (suggest to use high/medium/low with respect to safety significance for current safety case and important towards moving the disposal programme forward). Consider:

- *High: indicates an area that is significant to a particular driver*
- *Medium: indicates that the topic are is of some significant, but unlikely to be a detriment to progress of the overall programme*
- *Low: expected to be of little overall significance at this phase of the programme, although recognised as a topic area of interest*

T2.5 Decided what you need to do to fill the knowledge gap (review activity, international project opportunity to access existing data/knowledge, conduct experiment, other task).

T2.6 Illustrative Detailed Task Description using T2.1 –T2.4 Above

In development with co-authors to test content from Romanian Programme.

Group Leaders shall point out sections that are common to previous discussions (questions 1-5 – these will be consistent in updated template) and ask each person to add any other information that can be used to help prioritise and communicate an RD&D Task



Expand details in Prioritised List of RD&D Tasks: Group 1

Group leaders get more input from each individual (asking them more details taken from their completed Template 2) for each task in the original table – add and fill in more columns to capture other good points

Task Examples	1 Programme Driver?	2. Priority / Urgency (2, 5 or 10 years)?	3. Knowledge Gap?	4. Impact / Significance?	5. Timeframe to complete/ Cost		
Review of available geological environments and potential screening / siting criteria	Options Assessments and Costs Viability of GD	High Urgency to current programme – needed to inform policy and impacts other tasks – like concept options	Comprehensive and robust review of international best practice, develop siting options / approaches	High impact to drivers listed and significance high	2 years minimum Could be done relatively quickly but need to consider associated stakeholder engagement activities High % of available budget		
Development of model for Geosphere-Biosphere interface	No key driver for current Phase – very high level safety case / viability study required that could be completed without detailed G-B-G interface	Low Urgency (10+ yrs)	Low	Low Impact for current Phase - Consider review activity and possible participation in international project	Very Small % of available budget		



Feedback on Template?

Group Leaders shall ask at the end for suggestions and feedback on Template 2 – collect main points to report back to PLANDIS plenary session in Agenda # 14

Template 2 RD&D Prioritization Scheme and Illustrative Task Description

T2.1 Description of the Main Drivers for RD&D in Current Phase of Programme

T2.2 List Identified RD&D Tasks and their Urgency (i.e. summarise what you need to know by when for each driver listed above). This should consider:

- *is it needed immediately (up to 1 year), 1-3 years, 3-5 years, or 5-10 years?*
- *is it a site-specific tasks that should be delayed to future programme phase?*
- *is it needed to underpin next safety case document(s) or next programme phase activity?*
- *is it needed to maintain skills, expertise and capability in an important topic?*
- *is it needed for strategic decisions at Nuclear Power Plants (e.g. packaging of waste)?*

T2.3 What is the Knowledge gap for each Task (i.e. what is the gap between current understanding and the knowledge that you need to improve, high/medium/low)? This should consider:

- *High: little relevant information exists*
- *Medium: Information exists, but there would be benefit in carrying out further work during the current phase of the programmes*
- *Low: there is a considerable body of relevant knowledge, which is largely sufficient for current phase of the programme*

T2.4 Assess the Impact of each RD&D Task (suggest to use high/medium/low with respect to safety significance for current safety case and important towards moving the disposal programme forward). Consider:

- *High: indicates an area that is significant to a particular driver*
- *Medium: indicates that the topic are is of some significant, but unlikely to be a detriment to progress of the overall programme*
- *Low: expected to be of little overall significance at this phase of the programme, although recognised as a topic area of interest*

T2.5 Decided what you need to do to fill the knowledge gap (review activity, international project opportunity to access existing data/knowledge, conduct experiment, other task).

T2.6 Illustrative Detailed Task Description using T2.1 –T2.4 Above

In development with co-authors to test content from Romanian Programme.



- Draft Slides for Ray to Use in Overview Talk at PLANDIS (these will need re-drawing but show a way of communicating how the Guide fits in with the morning talks on Directive, role of IGD-TP (and joint research initiatives) etc.
- Slides first drafted by TB and GB, Feb 15.



Slide for Agenda#1 PLANDIS Guide Policy Context

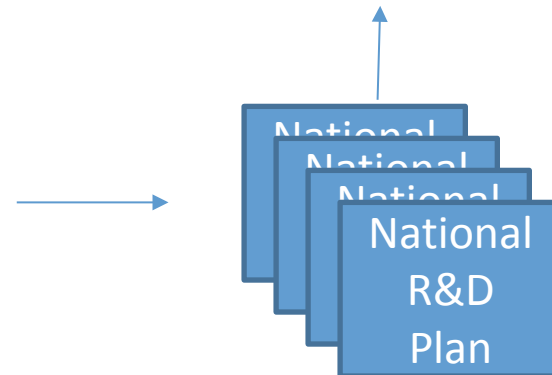
- Prerequisites:
 - Inventory
 - Cost
 - Financial and Human Resources
 - Transparency

Directive
(Entire Waste Mgt)

National Programme
(Art 12.1 a-k)
NAPRO Guide

PLANDIS Guide
(Art 12.1 f –R&D)
Disposal Only

- IGD-TP SRA (Disposal Only)
- Common or overlapping interests of national R&D plans, focussed on advanced programmes (2025)
- R&D (Art 12.1f)
 - Transparency (Art 12.1j)
 - Expertise & Skills (Art 8)





Slide for Agenda#1 How Projects Come About

IGD-TP SRA (Disposal Only)
 Common or overlapping interests of national R&D plans, focussed on advanced programmes (2025)

- R&D (Art 12.1f)
- Transparency (Art 12.1j)
- Expertise & Skills (Art 8)

Examples of how done now

CAST

MODERN

OTHERS



How done in Future

Joint-Research Programming in Europe

JOPRAD Practical Implementation

