Meeting Notes

Notes from TM-51533 First Plenary Meeting of the Second Phase of the International Project on Human Intrusion in the Context of Disposal of Radioactive Waste (HIDRA)

11-15 January 2016

Monday, 11 January 2016

1. Opening

   Following the opening remarks by A. Orrell (IAEA), Mr. A. Guskov (IAEA) was introduced as the Scientific Secretary for the second phase of HIDRA. Mr. R. Seitz (USA) and Ms. L. Bailey (UK) were introduced as the chair and co-chair of the meeting and the provisional agenda was accepted for the meeting. This was followed by brief introductions for all of the participants.

2. Background, HIDRA results and NEA activities

   The background information and an overview of current IAEA activities was provided by Mr. Guskov. This was followed by a summary of the HIDRA project. The status of the project report was discussed and each participant was provided access to the draft document. Comments were received from WASSC members and have been considered in the current draft.

   The presentations were followed by open discussion. The path forward for the document was discussed and it was decided to work towards finalizing the report and preparing for publication as a TECDOC. The emphasis on IHI rather than other human actions was confirmed. Potential integration with PRISM/PRISMA projects was discussed. Participants were encouraged to review the report as they were using it for discussions during the week.

   Mrs. L. Bailey gave a presentation summarizing current OECD/NEA safety case activities with an emphasis on considerations related to inadvertent

human intrusion (IHI). Some areas of particular interest for the discussion included: the concept of prescriptive and non-prescriptive regulations for IHI, the use of safety functions and FEPs for scenario development, the importance of addressing "as built" conditions compared to those conditions assumed for a safety case prior to construction. Mr. T. Beuth then briefly summarized recent activities on the RK&M project at the IAEA.

Mr. K. Moeller (IAEA) provided an overview and current status of the PRISM/PRISMA projects. The overview described the focus of the project on the safety case and decision-making through the lifecycle of a disposal facility. The use of generic sites and a role-playing approach in PRISMA to work through the decisions for a safety case was described. There was some discussion about how HIDRA could be integrated with PRISMA. It was stated that IHI was not specifically considered in detail as part of the decision-making considered for PRISMA, so there was an opportunity for HIDRA to complement the existing PRISMA scope.

3. Path Forward for Second Phase of HIDRA

Mr. R. Seitz provided a brief presentation describing proposed topics for the second phase of HIDRA that were discussed at the final HIDRA plenary meeting in December 2014 and were circulated for discussion following that meeting leading to a summary list for consideration. The potential objectives included: encouraging sharing of experiences and lessons learned, linking directly with the PRISM/PRISMA applications, testing and recommending improvements to the HIDRA methods by using generic examples for near surface and geologic disposal, considering the measures identified in HIDRA and potential additions/modifications and documenting the country-specific examples provided in HIDRA and adding new examples.

Key topics identified previously for consideration in the second phase include: effective communication, development of regulatory framework, practical application of optimization using scenarios and measures from HIDRA, and effectiveness of passive controls.

The discussion of the path forward for the project provided an opportunity for the participants to refine and adjust the draft plans based on their interests. The discussion included comments emphasizing practical application of HIDRA methods, is IHI like an alternative or a what-if type scenario? (generally consider more like a "what if"), should we expand to human actions?, how to address probabilities, emphasis on distinguishing between near surface and geological disposal, role of depth for near surface scenarios (and effect of erosion for timing), conducting general calculations for the near surface example, use calculations to address timing considerations in addition to depth, and focusing on decision making rather than just dose for calculations.

Specific recommendations were made for the objectives and scope. These are summarized in the Tuesday morning presentation.

Tuesday, 12 Jan 2016

1. National Example

   Ms. E. Andersson provided a presentation describing a recent safety assessment conducted in Sweden for the expansion of the SFR. The presentation provided details regarding the assumptions and approach to consider human intrusion and future human actions for the safety assessment. The regulatory framework and specific assumptions regarding the timing of intrusion, probability considerations, and dose criteria and results were described.

2. Path Forward for HIDRA II and Establishment of Working Groups

   Mr. R. Seitz provided a short presentation summarizing an updated version of the proposed objectives and scope for the project as the lead in for further discussion before dividing into working groups. The objectives and scope were refined and reflected in the initial draft of the TOR.

   It was decided to form two working groups: Geological Disposal and Near-Surface Disposal. Ms. E. Andersson volunteered to lead the geological

working group and Ms. A. de Hoyos volunteered to lead the near-surface working group. The participants were asked to sign-up for one of the two groups and the distribution provided a very good mix of regulators, implementers and technical support organizations for each group.

WORKING GROUPS	
Geological Disposal	**Near-Surface Disposal**
E. Andersson (lead) (I)	A. de Hoyos (lead) (TSO)
T. Beuth (TSO)	G. Kuciel (I)
C. Castel (R)	C. Markley (R)
W. Chen (I)	R. Markova-Mihaylova (R)
A. Galzy (TSO)	J. Mecke (R)
T. Hjerpe (I)	R. McLeod (R)
J. Kyllönen (R)	N. Rybulka (R)
S. Lei (R)	T. Shimizu (I)
J. de Mèredieu (I)	G. Sibiya (I)
J. Mibus (I)	L. Startseva (TSO)
J. Wollrath (I)	A. Tkachenko (I)
R – Regulator, I – Implementer, TSO – Technical Support Organization	

3. Plenary Summary

The working group leads provided summaries of the progress during the day as a lead-in for discussion of further refinement of the objectives and plans for the project. Both groups had made substantial progress starting to develop examples.

The near-surface working was considering how IHI would be included as part of the MASC Matrix from the PRISM project starting with the construction phase as an example. A draft spreadsheet was provided to

illustrate the process. Measures and scenarios would be considered next. The approach was to try to work on an example to help formulate reasonable objectives for the project.

The geological disposal working group developed more specific objectives and began to develop a list of IHI considerations for a regulatory framework. A new country was created as a basis for the generic examples. It was decided that the generic example would use elements of information from real examples. A potential concern was raised with the use of the term “stylized” because of difficulty explaining in multiple languages.

Wednesday, 13 Jan 2016

1. National Example

   Mr. R. McLeod (UK) provided a presentation describing recent efforts to develop a regulatory approach for human intrusion for cases of in-situ disposal of radioactive waste after remediation or decommissioning activities. Previous guidance for disposal was summarized and the evolution to the current perspective was described. The criteria involve dose guidance in a range from 3 to 20 mSv/yr with a period of restricted use (new terminology for active institutional control) up to 300 years. The approach included three types of scenarios: inadvertent intrusion, archeological (intrusion, but recognize hazard), and deliberate intrusion, where the first two are considered for a safety assessment.

2. Working Groups

   The remainder of the day was spent with the two groups working independently.

Thursday, 14 Jan 2016

1. National Example

   Mr. J. Kyllönen (Finland) provided a presentation on the regulatory approach to human intrusion in Finland. Most of the day was devoted for

WG discussions to develop the draft document and to discuss future work plans.

The groups worked independently for most of the day. At the end of the day the draft terms of reference were discussed and agreed upon.

Friday, 15 Jan 2016

1. Working Meetings

   Working Groups met independently to finalize work plans.

2. Closing

   R. Seitz and L. Bailey provided the closing summary for the activities during the week. The overall project scope and objectives were described and key topics to be considered were highlighted. Plans for completion of the report for the first phase of HIDRA were discussed and it was decided to send an updated draft to the participants for review prior to submittal to the publication process. The initial Terms of Reference for HIDRA II were completed with the scope, objectives and general working plan for HIDRA.

   Each of the working groups then provided more detail about the progress during the week and plans for future activities. Plans for completion of the HIDRA report and HIDRA II are summarized in the Annex.

   The Near-Surface working group identified the following accomplishments:

   - Identified rationale, objectives, scope and preliminary project plan
   - Identified and discussed IHI relevant SC arguments using the PRISM matrix
   - Developed Case 1 facility-specific IHI scenario and selected associated potential measures from HIDRA report database → "IHI considerations" box
   - Started to discuss considerations for Case 2.

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The Geological Disposal working group identified the following accomplishments:

- Developed scope and objectives and a work plan and preliminary time schedule
- Produced **generic list** of what information regarding IHI that could be considered when producing **regulatory framework**
- Developed **Example for the conceptual design stage** of the facility life cycle.
- Started to look into the **design and siting stage** of the life cycle of the disposal facility. Then more/all? of the HIDRA methodology can be applied.
- Identified **couplings** to other projects and documents that should be considered in the process of examining the example
- Decided to use examples from actual sites/assessments to have a starting point for our discussion. Decided to use specifics from different countries, although the combinations should be feasible
- Defined what data are needed from the contributing countries

The work plans for the project (see Annex) were briefly discussed and the meeting was then formally closed by A. Guskov and G. Bruno of the IAEA.

ANNEX. Proposed Project Plans

General Plans

- HIDRA Report will be submitted to publication process (March)
- Project will include 2 more plenary meetings
- Working groups will have independent meetings as needed
- IAEA Secretariat, co-chairs and working group leads will have planning meetings in advance of each plenary

Proposed Schedule for HIDRA II- General

- Terms of Reference – Initial Version (end of January)
- Tentative outline for project report (end of February)
- Co-chairs and WG leads meeting (Fall/Winter 2016)
- Second Plenary (23-27 January 2017)
- Third Plenary (2018)

Geological Disposal Working Group

General Work Plans

- Customize regulations
- Create a clear picture of our generic site.
- Identify inherent measures from the concept
- Create a clear picture of concept and design. Decision is made to have disposal concept and data from our participants.
- Test the Methodology of HIDRA

- Discuss frame safety framework in IHI aspect
- Customize scenarios / Identify initial sets of measures
- Assess the scenarios
- Review/evaluate measures (make sure it does not affect normal evolution)
- communication and consultation and knowledge management
- Proceed to next implementation step

- The effects on IHI should be discussed also for other variances than used in our example, e.g. different host rock and disposal concept. Could be reviewed after the methodology has been tested
- Synthesis (report) with suggestions of improvements to the methodology and measures database

Proposed Schedule

Directly after plenary

- List of site- and design information needed for the description of our general site are to be distributed among WG members – Thomas H (18 January)
- Identification of more data needed – all member (25 January)
- Information from countries added - contributors in the list (May)
- Text produced during the meeting gathered in one document and distributed - Eva (30 January)
- Comments on the text – all WG member (28 February)

WG meeting (end of Aug/Sept)

- Customized regulations

- Finalise description of general site
- Identify inherent measures from the concept
- Customized scenario
- Initial measures to be considered

2nd plenary, 3rd plenary

- Continue according to workplan

Near-Surface Disposal Working Group

Proposed Plan and Schedule

Before next plenary

- Inputs to the group report:
    - Drafting introduction → Richard, Amélie
    - Drafting scenario figures and evolution figure → Richard
    - Description of case 1 scenario (residential) → Julie
    - Description of case 2 scenario (drilling) → Julie, Radosveta
- Draft excel file for case 2 → Amélie
- Draft measures for case 2 → Radosveta
- Calculations for case 1? → Chris, Tomofumi, Liubov, Amélie for radon?

2nd plenary:

- Assessment of potential case 1 measures (optimization) and further iterations

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- Develop Case 2 facility specific IHI scenario and select potential measures. Use of a non prescriptive regulatory framework.
- Develop the societal scenario (influence and communication aspects)
- If possible, assessment of potential case 2 measures