International Workshop on the Safe Disposal of Low Level Radioactive Waste

ASN Headquarters, Montrouge, France
3-5, February 2015
Technical Visit: 6, February

IAEA
International Atomic Energy Agency
Safe Disposal of LLRW

*Chairperson:* Walter Blommaert
(Federal Agency for Nuclear Control, Belgium)

*Workshop scientific secretary:* Frans Boydon
(United Kingdom)

*IAEA Scientific Secretaries (organizers):* Yumiko Kumano and Gerard Bruno
Safe Disposal of LLRW

We greatly acknowledge **ASN** for hosting this Workshop and **ANDRA** for organizing a technical visit to its disposal facilities.
Workshop is composed of two words:

- **Work**: we are here to work together and to have an exchange of ideas and thoughts (brainstorming) on the aforementioned subject, and,

- **Shop**: the workshop gives everyone of us the opportunity to share (or shop) the available/gathered information, without having to pay (a lot) for it
How to get the most out of a workshop?

1. This workshop belongs to you and its success rests largely with you

2. Enter into the discussion, enthusiastically!

3. Give freely your experience

4. Confine your discussion to the problem

5. Say what you think
6. Only one person should talk at a time. Avoid private conversation while someone else is speaking.

7. Be patient with other members.

8. Appreciate others point of view.

9. Switch your mobile phone to silent mode!
Safe Disposal of Radioactive Waste

A quite complex matter:

- To be covered by a political/national strategy
- multiple aspects to be taken into account:
  - Technical and scientific aspects
  - Financial and economical aspects
  - Environmental and safety aspects
  - Societal and ethical aspects
- involving multiple stakeholders and,
- a high level of expertise in various disciplines.
Multiple Stakeholders involved

Government

Regulator(s)

Waste producers

International Agencies (AIEA, AEN, …)

Others …

NWMO

Research institutes

Public/Local Partnerships

Waste Management
Pluridisciplinary character of RWM

Hydro(geo)logy
Validation codes
Seismology
geophysics
phenomenology
mechanics
Rad protection
regulations
geochemistry
transport
corrosion
Etc …
2.5 days workshop

- Key note presentation by IAEA
- 9 country presentations
- Insights of IRSN’s safety review of French surface disposal facilities (IRSN)
- 1 plenary presentation on management of large amounts of waste arising from an emergency and legacy sites
- 1 presentation on LLW disposal - trends, developments and challenges -
- 4 round table discussions (4 topics)
- 1 panel discussion
- WS Summary
Tuesday, 3 February 2015

- **9:00-12:30**  **Session 1** - Opening session
  - Welcome address (ASN), Objectives and scope of the WS (IAEA), Remarks from the Chair, Administrative matters
  - Key note presentation (IAEA)
  - Experience in developing LLW disposal facilities in France (ASN, ANDRA)

- **10:50-11:10**  **Coffee break**

- **11:10-12:40**  **Country presentation (1)**
  - Belgium (FANC, NIRAS/ONDRAF)
  - Sweden (SKB)
  - Canada (CNSC)

- **12:40-13:50**  **Lunch break**
Tuesday, 3 February 2015

- **13:50-18:00**  
  **Session 2 - WG activity (topics 1 & 4)**

- **13:50-14:20**  
  Insights of IRSN’s safety review of French surface disposal facilities (IRSN)

- **14:20-14:30**  
  Introduction of WGs, WG leaders, and instructions

- **14:30-16:00**  
  WG discussion (Topic 1)

- **16:00-16:30**  
  *Coffee break*

- **16:30-18:00**  
  WG discussion (Topic 4)

- **18:15-**  
  *Welcome Reception*
Wednesday, 4 February 2015

• **8:30-12:30** Session 3 - Plenary Session
• **8:30-9:30** Debriefing of WG discussion on topics 1 & 4
• **9:30-10:00** LLW disposal - trends, developments and challenges (Peter Omai, IAEA)
• **10:00-10:30** Country presentation
  - Republic of Korea (Park Eunsang, KORAD)
• **10:30-10:45** Coffee break
• **10:45-12:45** Country presentations
  - Hungary (Attila Baksay, PURAM)
  - UK (Richard Cummings, LLWR)
  - Spain (Inmaculada López, ENRESA)
  - Pakistan (Wajahat Anjum, PNRA)
• **12:45-14:00** Lunch break
Wednesday, 4 February 2015

- 14:00-17:30  **Session 4 - WG activity (topics 2 & 3)**
- 14:00-14:10  **Session Introduction**
- 14:10-15:40  **WG discussion (Topic 2)**
- 15:40-16:00  **Coffee break**
- 16:00-17:30  **WG discussion (Topic 3)**
Thursday, 5 February 2015

- **8:30-13:00 Session 5 - Plenary Session**
- **8:30-9:30** Debriefing of WG discussion on topics 2 & 3
- **9:30-10:15** Plenary presentation on management of large amounts of waste arising from a nuclear, radiological emergency and legacy sites (Wolfgang Goldammer, Germany)
- **10:15-10:40** Coffee break
- **10:40-12:10** Panel Discussion – Panel:
  - France, Canada, Japan, USA, IAEA
- **12:10-12:30** WS Summary (Frans Boydon)
- **12:30-12:45** Administrative announcement for the site visit (ANDRA)
- **12:45-13:00** Closing remarks (Chair / IAEA / ASN)
- **13:00 - Adjourn**
International Workshop on the Safe Disposal of Low Level Radioactive Waste

- **Note to the speakers:**
  - present yourself briefly
  - presentations: 20 min and 10 minutes questions: respect the time given to you

- **When asking questions:**
  - name, country, organisation
  - speak slowly and clearly

- **Questions for the panel**
  - Please write them down and handover to Yumiko before Thursday (at the latest before coffee break in the morning)
International Workshop on the Safe Disposal of Low Level Radioactive Waste

- **Members of the panel:** prepare some ideas about:
  - What are according to you the main findings from
    - the Workshop
    - from past experiences?
  - Major issues still to be further improved / discussed / addressed to facilitate the safe implementation of LLW disposal?
  - How to build competence in the country for both regulator and implementer?
  - Preparedness for the management of large amount of waste arising from emergencies … how far is realistic?
  - Any suggestions and recommendations on IAEA future activities?
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Tuesday, 3 February 2015

• 13:50-18:00  Session 2 - WG activity (topics 1 & 4)
• 13:50-14:20  Insights of IRSN’s safety review of French surface disposal facilities (IRSN)
• 14:20-14:30  Introduction of WGs, WG leaders, and instructions
• 14:30-16:00  WG discussion (Topic 1)
• 16:00-16:30  Coffee break
• 16:30-18:00  WG discussion (Topic 4)
• 18:15-       Welcome Reception
Working Groups:

- 5 working groups will be organized with one leader per working group.
- The role of the working group leader will be to facilitate and organize the discussions and to report on it in the next session.
- All working groups will address the same topics - 4 topics are planned.
- In order to facilitate the discussions within the working groups a series of statements or subjects are provided for each topic.
Leaders for the working groups:
- Wolfgang Goldammar (Germany)
- Jeroen Mertens (FANC, Belgium)
- Lynne Jones (Canada, AECL)
- Amélie Dehoyos (IRSN, France)
- Richard Cummings (LLWR, United Kingdom)
- IAEA (if more than 5 WGs)

Debriefing of WG discussions on Wednesday and Thursday morning, with special attention to suggestions and recommendations for the IAEA (programme, guidance etc.)?
Working group sessions

- As leader you can choose a rapporteur (volunteer?) from the team
- Free to include interesting and associated topics
- Prepare a short presentation at the end of each WG session to avoid misunderstanding afterwards
- Write major findings and list topics you want to be discussed
- Non-formal short summary (+/- 5 min) next morning
1. Teamwork is essential. It allows you to blame someone else.
2. If you explain something so clearly that no one can misunderstand, someone will.
3. Nothing is ever as simple as it seems.
4. It is a fundamental law of nature that nothing ever quite works out.
5. When you do not know what you are doing, do it neatly.
6. Science is truth, don’t be misled by facts.
Working group sessions

4 Topics:

- Development of a disposal concept
- Challenges in developing a safety case
- Licensing process and responsibility for safety
- Post-closure aspects
Topic 1: Development of disposal concept

- How to deal with radiation protection principle
- How to deal with safety concepts such as demonstrability, defense in depth, and robustness
- Feedback from design and operation of existing facilities – positive and negative feedback (what should be done/ what should not be done)
- How to evolve the safety concept into specific design and safety case
- Site properties (characterization and qualifications, geology, hydrogeology etc.)
- How to incorporate physico-chemical processes induced by the waste in the safety concept
- Waste characterization
- Optimization of disposal concepts
Topic 4: Post-closure aspects

- License termination
- Memory keeping and transfer of responsibility
- Is (non-radiological) monitoring and surveillance necessary once license is finished, who will be responsible for it?
- Needs for land-use restriction and legal assurance for it?
- Human intrusion – link to institutional control? What is the government/regulator/operator’s responsibility? How to transfer the responsibility?
- Need for retrievability and decision point
- Remediation
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- **8:30-12:30**  **Session 3** - Plenary Session
- **8:30-9:30**  Debriefing of WG discussion on topics 1 & 4
- **9:30-10:00**  LLW disposal - trends, developments and challenges (Peter Omai, IAEA)
- **10:00-10:30**  Country presentation
  - Republic of Korea (Park Eunsang, KORAD)
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  - Spain (Inmaculada López, ENRESA)
  - Pakistan (Wajahat Anjum, PNRA)
- **12:45-14:00**  Lunch break
Wednesday, 4 February 2015

- 14:00-17:30  **Session 4 - WG activity (topics 2 & 3)**
- 14:00-14:10  Session Introduction
- 14:10-15:40  WG discussion (Topic 2)
- 15:40-16:00  *Coffee break*
- 16:00-17:30  WG discussion (Topic 3)
Topic 2: Challenges in developing a safety case

- How to develop and update safety case
- How to define WAC
- How to develop scenarios and modeling
- How to identify inventory and key radionuclides
- How to characterize the physico-chemical composition of the waste
- Treatment of uncertainties
- New type of waste: how to adopt and incorporate into safety case
- Availability of skilled personnel
- Public involvement in disposal project development
- Consideration on climate change and other long-term impacts
Decision making process
Challenges (regulator and operators’ challenges)
Responsibility in different steps of facility development
How to review SC (availability of skilled personnel) / periodical review
Public involvement
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Thursday, 5 February 2015

- **8:30-13:00** *Session 5 - Plenary Session*
- **8:30-9:30** Debriefing of WG discussion on topics 2 & 3
- **9:30-10:15** Plenary presentation on management of large amounts of waste arising from a nuclear, radiological emergency and legacy sites (Wolfgang Goldammer, Germany)
- **10:15-10:40** *Coffee break*
- **10:40-12:10** *Panel Discussion* – Panel:
  - France, Canada, Japan, USA, IAEA
- **12:10-12:30** *WS Summary* (Frans Boydon)
- **12:30-12:45** Administrative announcement for the site visit (ANDRA)
- **12:45-13:00** Closing remarks (Chair / IAEA / ASN)
- **13:00** - Adjourn
Panel discussion

- **Moderator:**
  - Walter Blommaert (WS Chair)

- **Panel members:**
  - France (Loic Tanguy, ASN)
  - Canada (Karina Lange, CNSC)
  - Japan (Kazuyuki Kato, NDF)
  - U.S.A (Gregory Suber, NRC)
  - IAEA (Andrew Orrell)
Members of the panel:

What are according to you the main findings from
  - the Workshop
  - from past experiences?

Major issues still to be further improved / discussed / addressed to facilitate the safe implementation of LLW disposal?

How to build competence in the country for both regulator and implementer?

Preparedness for the management of large amount of waste arising from emergencies … how far is realistic?

Any suggestions and recommendations on IAEA future activities?
Many thanks

to ASN and ANDRA

to IAEA

to all of you

and have a safe trip to wherever you go