

# Belgium



# Belgium – General Discussions 1(4)

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- Contracting Parties of CG4 being present:  
Belgium, Botswana, China, Italy, Luxembourg, Republic of Moldova  
  
(not present: Albania, Congo, Gabon, Kazakhstan,  
North Macedonia)
- Other CPs being present  
Australia, Canada, France, Germany, Netherlands, Norway,  
Slovenia, Switzerland, United Kingdom, United States of America

# Belgium – General Discussions 2(4)

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- Issues discussed
  - Bilateral agreement between Luxembourg and Belgium for treatment and disposal of small volumes waste
    - Legal basis
    - Scope
    - Transfer of ownership of Luxembourg waste under the contract with ONDRAF/NIRAS
    - Public consultation and acceptance
  - Strategy for long-term management of spent fuel until geological disposal is possible
    - Licensing arrangements at NPPs (e.g. in relation to site end states)
    - Technical understanding of fuel cladding performance over time
    - Ageing management programmes for spent fuel and storage facilities

# Belgium – General Discussions 3(4)

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- Issues discussed (continued)
  - Maintaining information on spent fuel in storage when responsibility is transferred to ONDRAF/NIRAS
  - Relationship between emerging policy for geological disposal and understanding gained from past research and assessment activities
  - Belgian engagement in development of regional disposal concepts and relationship to the reversible decision process
  - Basis for establishing timescales for approval of decay storage regarding very short-lived wastes (clearance levels vs. “nearly complete decay”)
  - Practice of conditional clearance and licence for release of materials to a defined destination
  - Approach to definition of conditional clearance levels for Ra-226

# Belgium – General Discussions 4(4)

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- Issues discussed (continued)
  - Facilities for the management of residues of irradiated high-enriched uranium
  - Responsibilities for safety and role of ONDRAF/NIRAS in relation to decommissioning of NPPs
  - Concept and roles of the cultural and visitor centre at the near-surface disposal facility
  - Remaining challenges regarding the management of non-conforming waste
  - Regulatory perspective on knowledge management within NPP operators as facilities move from operation into dismantling
  - Strategy and legal framework for management of orphan sources

# Belgium – Follow-up of suggestions from 6<sup>th</sup> Review Meeting

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- Belgium is encouraged to establish a timeline for a policy decision on HLW disposal and the management of radium-bearing wastes and spent fuel

Definition and establishment of national policy is the responsibility of the Federal Council of Ministers, and has to be established as a Royal Decree. Proposal submitted by ONDRAF/NIRAS in 2018 regarding geological disposal within the territory of Belgium was subject to strategic environmental assessment and public consultation in 2020. Advice on the proposal was submitted by FANC. Final national policy proposal (deep geological disposal, with a participative and reversible decision process) submitted by ONDRAF/NIRAS to Federal Government September 2020. A decision was taken by the Council of Ministers in April 2022 to launch the legal process for adoption of the policy.

- Belgium is encouraged to fully complete implementing financial guarantees for all operators

Task Force created by supervising ministers in 2021, with a focus on legal framework for financial issues relating to radioactive waste management (including financial guarantees). Covers enhancement of financial guarantees for operators other than NPPs. Task force will submit its proposal to the responsible ministers in 2022.

# Belgium – Follow-up of challenges from 6<sup>th</sup> Review Meeting 1(3)

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- Dealing with major non-conformities of conditioned NPP waste discovered during inspections

Roadmap developed by ONDRAF/NIRAS covering major themes, including inspections, R&D as well as operational and long-term safety assessments. Development of a new dedicated storage facility on the Belgoprocess site to accommodate potentially affected waste drums (target operation Spring 2024). Options for long-term management have been identified in the programme and will be assessed by FANC. Development by ENGIE Electrabel of alternative conditioning processes for waste streams of primary concern. ONDRAF/NIRAS, Belgoprocess and ENGIE Electrabel report on progress to FANC on a regular basis.

- Clarification of the status and policy for SF – reprocessing or direct disposal  
Both options formally remain open until taken up in National Policy. This affects a fraction of spent fuel for which reprocessing may be considered, with both alternatives covered in the ONDRAF/NIRAS reference programme that is used as a basis for costing exercises and the RD&D programme. Disposal of spent fuel not expected before 2100.
- Approval and implementation of waste policy for long-term management of HLW and long-lived wastes

See information related to similar suggestion (previous slide)

# Belgium – Follow-up of challenges from 6<sup>th</sup> Review Meeting 2(3)

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- Development of plan for radium-bearing wastes

Common position on categories of, and long-term management options for, radium-bearing minerals and wastes formulated by FANC and ONDRAF/NIRAS. This forms a working basis for implementation of an action plan for site remediation work. Part of the radium inventory incorporated in ONDRAF/NIRAS proposals for geological disposal, and part is to be covered by an additional policy proposal.

- Regulatory guidance on decommissioning (clearance, site release, staff, licensing)

Internal competence-building at FANC completed 2019. Project resulted in the publishing of several notes providing guidance for Class I licensees.

- Consequences of nuclear energy phase-out on the waste management chain

Co-ordination of all waste management steps by ENGIE Electrabel, ONDRAF/NIRAS and FANC



# Belgium – Follow-up of challenges from 6<sup>th</sup> Review Meeting 3(3)

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- Licensing and construction of the surface disposal facility

Updated safety case submitted to FANC February 2019 following initial regulatory review. Public inquiry on the licence application held November-December 2019. Further updates to licence application subsequently prepared by ONDRAF/NIRAS, with a licence expected in 2023. Plan is that facility for producing disposal monoliths will be in operation early 2024, while construction of the disposal facility should begin in 2024 and the facility should be in operation from 2027.

- Prepare for final shutdown and decommissioning of NPPs (2022-2025)

Discussions between ENGIE Electrabel and FANC started 2018, aimed at clarifying strategic issues relating to “post-operational phase” following notification of permanent shutdown (e.g. adaptation of SAR and technical specifications, staffing levels, impact on remaining operational units), preparation of dismantling licence and design of new facilities that may be needed to support dismantling.

Regular exchanges and workshops between ONDRAF/NIRAS, FANC and the licensee on issues (e.g. logistical management of waste flows and new facilities) relating to spent fuel and waste management. Development of a proposed legal framework to secure liabilities relating to spent fuel and waste management.

# Belgium – Follow-up of overarching issues from 6<sup>th</sup> Review Meeting

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- Implementation of national strategies for spent fuel and radioactive waste management

A major theme of issues addressed within the National Report, including reporting on progress with challenges

- Safety implications of long-term management of spent fuel

An integral element of the Belgian programme, including long-term interim storage prior to final geological disposal.

- Linking long-term management and disposal of disused sealed radioactive sources

Long-term management and disposal of disused sealed sources incorporated into the strategic programme for nuclear fuel cycle wastes and application wastes

- Remediation of legacy sites and facilities

Progress in relation to remediation planning for the Umicore site at Olen is described in the National Report and Presentation.

# Belgium – Updates since submission of National Report in October 2020

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- Creation by supervising Ministers in 2021 of a Task Force to review the legal framework for radioactive waste management, with a focus on financial issues, including financial guarantees
- Decision by the Council of Ministers (April 2022) to launch the legal process for adoption of ONDRAF/NIRAS proposed national policy on long-term management of high-level and long-lived waste
- Finalisation of several updates to the legal and regulatory framework
- Notification of permanent shutdown of Doel 3 (April 2022). Shutdown planned October 2022 - regulatory review ongoing.

# Belgium – Impact of SARS-CoV-2 pandemic on matters addressed by Joint Convention

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- Licensees
  - Constant monitoring
  - Separation of teams
  - Continuity of operations ensured (mandatory facial masks, sanitary interventions)
- Regulatory body
  - Continuity of operations ensured (with some re-scheduling)
  - Essentially home-based working
- Surveillance of installations
  - Weekly follow-up of COVID-19 situation during critical period
  - Reduced inspection teams, on-line inspections if possible
  - Modified approaches to reduce administrative burden on hospitals

# Belgium – Overview Matrix 1(2)

Type of Liability	Long Term Management Policy	Funding of Liabilities	Current Practice / Facilities	Planned Facilities
<b>Spent Fuel</b>	<ul style="list-style-type: none"> <li>Long-term management policy still to be defined: disposal of waste from reprocessing or direct disposal</li> </ul>	<ul style="list-style-type: none"> <li>NPP operators contribute to fund managed by SYNATOM</li> <li>Various funds financed by state for spent fuel from research reactors</li> </ul>	<ul style="list-style-type: none"> <li>On-site wet and/or dry storage of SF from NPPs</li> <li>Storage (Belgoprocess) or reprocessing of spent fuel from research reactors</li> </ul>	<ul style="list-style-type: none"> <li>Geological disposal still to be confirmed by policy decision (disposal and pre-disposal facilities to be decided)</li> <li>Extension of dry storage facilities for spent fuel at NPPs</li> </ul>
<b>Nuclear Fuel Cycle Waste</b>	<ul style="list-style-type: none"> <li>SL-LILW: Near surface disposal</li> <li>LL-LILW and HLW: policy still to be defined</li> </ul>	<ul style="list-style-type: none"> <li>Producer pays through contributions to ONDRAF/NIRAS long-term fund</li> <li>Various funds for historical liabilities, state financed</li> </ul>	<ul style="list-style-type: none"> <li>Centralised storage at Belgoprocess site of all SL-LILW, LL-LILW, together with HLW that has been transferred to ONDRAF/NIRAS</li> </ul>	<ul style="list-style-type: none"> <li>Surface disposal for SL-LILW at Dessel, including the disposal facility and other facilities for waste packaging for disposal</li> <li>Storage building at Belgoprocess for the ASR non-conform waste</li> <li>Geological disposal of LL-LILW and HLW still to be confirmed by policy decision (disposal and pre-disposal facilities to be decided)</li> </ul>
<b>Application wastes</b>	<ul style="list-style-type: none"> <li>SL-LILW: Near surface disposal</li> <li>LL-LILW: Policy still to be defined</li> <li>Radium waste: policy still to be defined</li> </ul>	<ul style="list-style-type: none"> <li>Producer pays through contributions to ONDRAF/NIRAS long-term funds.</li> <li>Insolvency fund.</li> <li>Radium waste – producer pays</li> </ul>	<ul style="list-style-type: none"> <li>Centralised storage at Belgoprocess site of all SL-LILW, LL-LILW</li> <li>Radium waste storage at Umicore/Olen</li> </ul>	As for nuclear fuel cycle wastes

# Belgium – Overview Matrix 2(2)

Type of Liability	Long Term Management Policy	Funding of Liabilities	Current Practice / Facilities	Planned Facilities
<b>Decommissioning liabilities</b>	<ul style="list-style-type: none"> <li>Responsibility of operator; approval of decommissioning plan by ONDRAF/NIRAS</li> <li>SL-ILW: near surface disposal</li> <li>LL-ILW: policy still to be defined</li> </ul>	<ul style="list-style-type: none"> <li>NPP operators contribute to the fund managed by SYNATOM</li> <li>Various funds for historical liabilities, state financed</li> <li>Transfer of financial means to funds managed by ONDRAF/NIRAS when waste is transferred</li> </ul>	Current projects: <ul style="list-style-type: none"> <li>BR3 research reactor</li> <li>Eurochemic reprocessing plant</li> <li>Former SCK CEN waste department</li> <li>Several cyclotron facilities (e.g. ex-”Best Medical Belgium”)</li> </ul>	As for nuclear fuel cycle wastes
<b>Disused Sealed Sources</b>	Implementation of EU directive, recovery of orphan sources	If no return, holder has to set up financial guarantee	Return to supplier, decay storage or transfer to ONDRAF/NIRAS	As for nuclear fuel cycle wastes

# Belgium – Challenges

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- Finalising construction and commissioning of new radioactive waste storage facilities at Belgoprocess
- Decommissioning of NPPs and other facilities
- Determining the status of spent fuel
- Establishing and implementing national policy on long-term management of HLW and long-lived wastes, including a stepwise, reversible and participative decision process
- R&D programme on Partitioning and Transmutation (as an alternative management pathway for spent fuel – but not an alternative to disposal)
- Site remediation for radium-bearing waste at Umicore, Olen
- IRRS and ARTEMIS missions in 2023
- Programme for long-term management of non-conform waste

# Belgium – Planned Measures to Improve Safety

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- Licensing and commissioning of new waste management facilities
- Remediation and decommissioning activities at the radioelement production facility ex-”Best Medical Belgium” in Fleurus
- Agreement and implementation of national policy for long-term management of high-level and/or long-lived radioactive waste and spent fuel
- R&D programme on partitioning and transmutation (maintenance of knowledge and expertise in the nuclear field, as well as potential method for optimising geological disposal)
- Preparation of site remediation projects for radium-contaminated areas at the UMICORE site, Olen
- Licensing, construction and operation of the near surface disposal facility



# Belgium – Suggestions

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- None

# Belgium – Areas of Good Performance 1(2)

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- Evolution of the legal framework, e.g.
  - Avoiding liabilities
  - Significant updates in relation to the safety of radioactive waste management (in particular with reference to work within WENRA)
- Progress on clarification of interrelations between ONDRAF/NIRAS and FANC
  - Joint inspections by FANC and ONDRAF/NIRAS
  - Role of FANC with respect to the waste acceptance system
- Progress on national policies
  - Significant progress with regard to definition of national policy on HLW and long-lived wastes, as well as action plan for the management of radium-bearing residues
  - Stepwise, reversible process for decision making
- Co-ordination between FANC, ONDRAF/NIRAS, Bel V and licensee in preparation for decommissioning of NPPs

# Belgium – Areas of Good Performance 2(2)

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- Developing a strong and structured nuclear and radiological emergency plan, based on lessons learned, international requirements and stakeholder involvement

# Belgium – Good Practices

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- Entering into a bilateral agreement (as a country with significant nuclear infrastructure) to receive, treat and dispose of small volumes of waste from a neighbouring non-nuclear country

# Belgium – Conclusions

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- A comprehensive and clear presentation, leading to a good and open discussion
- Key steps being taken towards clarification of policy and strategy for all categories of radioactive waste
- Active cooperation in international research and standards development
- Significant investments to address challenges from historical non-conforming wastes and legacy sites