

Impact of the NEA Peer Review of SAFIR 2 on the future programme

5th IGSC meeting – October 15-17 2003

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Context and terms of Reference of NEA review

- On request of Belgian Government
 - Review report submitted to responsible minister (August 2003)
 - No official reaction yet
- Review focus on
 - Long-term safety assessment methodology, the well-fondness of its results and the quality of its scientific and technical bases
 - The remaining key uncertainties and the RD&D programme that is proposed to deal with them in the next phase of the programme



General observations (1/9)

- SAFIR 2 is first integration exercise
 - Attempt to combine knowledge accumulated to date into integrated safety case format
- Hybrid report
 - Status report R&D period 1990 – 2000
 - Put into framework of a safety assessment
 - Future: two aims not to be fulfilled by single report
- Some analyses (scenario analyses) outdated



General observations (2/9)

- Fundamental role of Boom Clay acknowledged
 - Main barrier in disposal system
- More credit could be taken for EBS performance
 - Full effectiveness of multibarrier concept should be analysed and argued
 - In order to enhance robustness claims
- Uncertainty management to be developed further (how to define programme priorities ?)



General observations (3/9)

- Transferability of information from experiments to models
 - adaptation of models to different and changing *in situ* conditions to be improved
 - Balance to be struck between predictive capability (realism and mechanistic understanding) and capability to support safety through robust models and arguments



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General observations (4/9)

- A good basis exists for the future programme
 - Studies made are relevant
 - Excellent platform exists to continue the disposal programme
 - Information very extensive + covers all relevant areas
 - Work in line with other national programmes
 - Some novel and innovative methods and tools (safety functions, complementary safety indicators)



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General observations (5/9)

- Boom Clay at Mol and associated repository concept
 - Good focus of R&D programme
 - Geological situation in Belgium
 - Choices (Boom Clay at Mol/Dessel) are justified
 - Adequate properties for safety and construction
 - But: better argue "geological stability" and "engineering ability"



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General observations (6/9)

- Ypresian Clays
 - Advantages (e.g. no exploited aquifer underneath) and disadvantages (e.g. lower mechanical strength, heterogeneity, more saline interstitial water)
 - Transferability between host formations or between sites within the same host formation of methods and information is important issue



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General observations (7/9)

- SAFIR 2 report suitable basis for dialogue with regulators and policy makers
- SAFIR 2 highlights the need for further support and clarification at the policy level:
 - To move ahead beyond the methodological R&D phase
 - To start consultations on siting (+ dialogue with other stakeholders)
 - What considerations to be given to monitoring and retrievability ?



General observations (8/9)

- SAFIR 2 highlights need for a regulatory framework on issues such as
 - Criteria for judging safety and compliance
 - Radiological and non-radiological protection of the relevant water resources
 - Time frames for assessing regulatory compliance
 - Human intrusion
- Merit of SAFIR 2: extensive review of international guidance when national guidance was missing



General observations (9/9)

- Clear awareness of future R&D needs, BUT: need to develop strategy for setting priorities and structured approach for managing uncertainties
- Programme sufficiently advanced to address siting issue
 - Important experimental capability and database of information (Competent experimental team and URF HADES)
 - Important capability in area of safety assessment
 - At the forefront internationally in considering stakeholder involvement (Low level waste programme + SAFIR 2 companion booklet "Towards a sustainable management of radioactive waste")



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Lessons learnt NIRAS/ONDRAF (1/3)

- Most of remarks and recommendations were somehow expected
- The weaknesses and uncertainties have been confirmed
- An auto critical attitude is beneficial (and not only with respect to peers, but to all stakeholders)
- Peer Review has forced the team to better justify and argue
 - Arguments for the relevance of the studied system
 - Justifications of past decisions on e.g. design and material selection



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Lessons learnt NIRAS/ONDRAF (2/3)

- More unexpected
 - Importance of recommendations on policy and regulations
 - Clarification of political choices on radioactive waste disposal
 - Definition of a general strategy for the protection of aquifers
 - Adaptation of regulations to the case of disposal
 - Programme sufficiently advanced to tackle the issue of siting
- Challenging experience for the team



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Lessons learnt NIRAS/ONDRAF (3/3)

- A difficulty resides in the time gap between the period covered by the report and the moment of the review
 - New achievements and evolutions in the programme
 - Positive: shows the reactivity of the programme
 - Negative: complicates the discussions during the review



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Impact on the future programme (1/5)

- Next reporting milestone: Safety and Feasibility Case 1 (2013)
- Focus on technical (construction and operation) feasibility for high level waste (vitrified waste and spent fuel), with a.o. large *in situ* experiments
 - Thermal impact
 - Sealing and plugs
 - Waste handling
 - Not yet optimisation
- Focus on compatibility waste - clay for intermediate level waste (bituminous waste)



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Impact on the future programme (2/5)

- Focus on integration
 - within the study of component performance (e.g. radionuclide migration, geochemistry, radiochemistry, natural analogues ...)
 - within the study of the system: integrating the interactions between scientific understanding - design and technology – evaluations
 - By restructuring the programme and the disposal team
- Focus on arguments and uncertainty management
- Focus on Knowledge Management and traceability



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Impact on the future programme (3/5)

- Interaction with Safety Authorities
 - Started officially for disposal of high level long-lived waste beginning of 2003
 - Emphasis on
 - Policy and Regulatory issues (e.g. decisional process, siting process, protection of water resources, monitoring, retrievability, foundations of a safety case)
 - Strategic issues of the disposal programme (e.g. transferability of information to another host formation and sites)



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Impact on the future programme (4/5)

- Confirmation of the disposal option
 - Elaboration of a Strategic Environmental assessment
 - Milestone 2008
 - Assessment of alternatives (technical, host formation, design, planning)
 - Stakeholder involvement
 - Practical implementation of the EU directive ? - to be discussed with safety and environmental authorities



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Impact on the future programme (5/5)

- Interaction with the stakeholders
 - From the local to the national level (bottom - up and top - down approach)
 - Already clear demands from the local partnerships for low-level short-lived waste for a dialogue on high-level waste management and disposal
 - Preparatory work 2003 - 2004
 - Siting issue to be tackled
 - Strong interactions with the SEA work



Conclusion

- An intensive exercise, mobilising the small team during a considerable period of time
- Critical and constructive review
- Appreciated input on the technical AND strategic level
- Useful elements for
 - prioritising and structuring the next phase of the programme
 - clarifying the decisional process
- ONDRAF/NIRAS thanks the Review Team and NEA

