Safeguards Challenges at the Back-End of the Nuclear Fuel Cycle

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Safeguards context

- Agreements that nuclear material will not be diverted for non-peaceful purposes
  - –No diversion of declared nuclear material
  - –No misuse of declared facilities
  - –No undeclared nuclear material or facilities

Back-end options

- Interim storage, reprocessing and direct disposal will coexist
- All either have or can/will be safeguarded
- Specific and common issues

Reprocessing	Storage/disposal
- Separates uranium and plutonium	- No processing of spent fuel
- Material available (verification, re-use)	- Material difficult/ ‘impossible’ to access
- Material continues to require safeguarding	- Material continues to require safeguarding

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Safeguards approaches

- Different technical challenges
  - Reprocessing: ‘Ease’ of access, complex processing
  - Storage/disposal: Indirect verification
- Same objectives/outcomes
  - Reprocessing safeguards demonstrated
  - Storage safeguards demonstrated
  - Disposal safeguards developed
- All based on a continuing understanding of:
  - Amounts and locations of material
  - Facility operation
- More similarities than differences

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Safeguards measures

- Nuclear material continues to be subject to safeguards even after geological disposal
- Verification of repository design, construction and operation
- Verification of material receipt and flow
- Measures to ensure that material is not secretly removed

- During operational period
- Following repository closure

- In context of state level concept

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