ENISS
Waste & Decommissioning Safety Group
-
Considerations on Graded approach in Regulation for Decommissioning

WENRA Workshop on Regulatory Aspects of Decommissioning
5th-7th November 2019

Alain Ensuque
ENISSL: Creation and Missions

- **2005, European Nuclear Installations Safety Standards initiative**, under the umbrella of FORATOM
- NPP and Nuclear Facilities Licensees
- Focus: Safety

- Interact with WENRA
  - Common licensees view on SRLs
- Exchange of information on the interaction of licensees with their national regulators, → harmonization
- Cooperate with the European Institutions on regulatory issues
- Interact with IAEA: observer status in NUSSC, WASSC, RASSC, NSGC, EPReSC
- Interact with other stakeholders: ENSREG, EUR, WNA, ICRP, NEA...
- Develop Position Papers, in a pro-active approach to address issues related to Safety
ENISS Organisation

ENISS Steering Committee

Chairman: Roger Lundmark
Director: William Ranval; Manager: Muriel Glibert

ENISS Secretariat

Chairman: Gerd Bassing
Chairman: Alain Ensuque

RSG
Reactor Safety Group

WDSG
Waste & Decommissioning Safety Group

SEG
Security Expert Group

EP&R EG
Emergency Preparedness and Response

EGRP
Expert Group Radiation Protection

Task Forces

Philippe Bosquet
John Skegg
Bernd Lorenz
Position Papers

Position paper finalized:
- Risk-Informed, Reasonably Practicable, Cost-Benefit Analysis concepts

Topics being considered for W&D:
- Transition from operation to decommissioning
- De-licensing/release of site
- Waste-led decommissioning
- Standardized processes and quick decommissioning for the benefit of safety and dose reduction
Position Paper

Risk-Informed, Reasonably Practicable, Cost-Benefit Analysis concepts

- ENISS conducted a thorough reflection on the concepts risk-informed, reasonably practicable and cost benefit analysis
  - Definitions → Common understanding
  - Benchmark: existing applications (or non applications)
  - Build and propose a harmonized approach based on key principles

- Industry wishes to have a dialogue with regulators on these subjects

- Paper available on ENISS website
Objective

Make the right investment choices for safety

Means

Apply Risk-Informed Approaches

Success Condition

Consistent Regulatory and Licensing principles and programs

**Principles**

1. Investment in nuclear safety should provide significant safety improvement

2. The necessary investment for risk reduction should be commensurate with the effective safety net benefit

3. In risk informed approaches, a comprehensive set of contributions should be used

4. A set of goals and criteria for the application of CBA and Reasonably Practicable should be developed

5. Licensees and Regulators need accepted risk informed approaches and methods (with associated acceptance rules and criteria)

6. Suggested risk informed principles should be used consistently in regulatory processes

7. Cost Benefit Analysis (CBA) ought to be acknowledge as an acceptable method within national regulations

8. Definition and interpretation should be clarified regarding “reasonably achievable” and “reasonably practicable” in connection with the concepts of Best Available Technology and Continuous Improvement
Application to Decommissioning

Context of decommissioning:

- Nuclear risk significantly reduced vs Operation
- Risk changing (most often decreasing) as the decommissioning is progressing
- Increase of the relative importance of industrial safety

At stake:

- Allow approaches/methods more appropriate: focus on risks, simplification, efficiency…
- Open the decommissioning market to a wider supply chain
Regulatory framework & adaptation to actual risk in decommissioning

Implementation of requirements

- Safety
- RP
- Efficiency

- Adaption to level of risk
- At each stage of the decommissioning process

Graded/Proportionate approach

- Risk informed
- Cost-benefit analysis
- Reasonably practicable
ALARP approach of Safety Case for defueling
EDF Energy – UK
(Still to be agreed with ONR)

- 14 AGRs in operation, on 7 sites
- First shutdowns:
  - 2023 (Hinkley Point B and Hunterston B)
  - 2024 (Hartlepool & Heysham 1)
- First step of decommissioning: defuelling

Optioneering approach
- First step: High level, ~10 options
- Second step: - Detailed optieneering
  - multi-criteria analysis
ALARP approach of Safety Case for defueling
EDF Energy - UK

Detailed optioneering

Environmental benefits

Environmental disbenefits

Safety benefits

Commercial benefits

Commercial disbenefits

Safety disbenefits

Table 3: Phase 1 Optioeneering Table

<table>
<thead>
<tr>
<th>Option</th>
<th>Safety benefits</th>
<th>Environmental / EATNOM benefits</th>
<th>Commercial benefits</th>
<th>Safety disbenefits</th>
<th>Environmental / EATNOM disbenefits</th>
<th>Summary</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Never significant</td>
<td>Rarely evidence</td>
<td>Rarely significant</td>
<td>Countermeasures</td>
<td>Gains efficiency in institutional impacts</td>
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ENISS
European Nuclear Infrastructure Safety Standard
Bradwell
Magnox, UK

Sealing of redundant Fuel Cooling Ponds

- Preparation for entry into C&M
- Application of sealant (polyurea coating) over contaminated surfaces of the ponds rather than further decontamination
- ONR’s Project Assessment Report:
  - Low level of residual risk
  - Key principle of proportionality
  - Balanced judgement
Brennilis
EDF, France

Cleaning up of discharge channel

- Initial characterization: low level of activity, no emergence from background
- Full decontamination required
  Target: < 100 Bq/kg Co\textsuperscript{60}
- 1500 t of earth sent to ANDRA VLL repository
- 94 transports
- Oct 2011/Oct 2013

OPEX

- Improved methodology
- Management of repositories capacities
- ASN Guide 24
- Extensive vs Full Decontamination
Doel
Electrabel, Belgium

Preparation for the decommissioning of Doel 1 & 2

- Assessment of full primary system decontamination
- RP benefits derived in man.Sv monetary value, including:
  - Lower collective dose
  - Impact on dismantling
  - Impact on radwaste management
- Comparison with required investment:
  - Benefit 2.5 higher than cost
PSR in decommissioning

- Regulatory requirement, IAEA standard;
- General rule: 10-year review, as during operation;
- Adaptation to Decommissioning through risk informed approach?

- **Sweden**  PSR required by Nuclear Act. But possibility of exemption, approved by the Authority, if the risk level is low (e.g. after defueling)

- **Finland**  PSR required by STUK YVL guide D.4, in compliance with the licence conditions “and in any event no later than 15 years of the date when a comparable comprehensive safety review was last conducted.”

- **UK**  PSR is a licence condition. Carried out every 10 years for EDF Energy NPPs. Beyond end of generation, the arrangements will be reviewed to ensure they are proportionate to the risks. Any change to the arrangements will be agreed with the ONR prior to implementation.
Risk-Informed, Reasonably Practicable & Cost-Benefit Analysis concepts

- ENISS conducted a thorough reflection on the concepts risk-informed, reasonably practicable and cost-benefit analysis
- Industry wishes to have a dialogue with regulators on these subjects
- Discussion could be on high level principles developed by ENISS, for instance
  - Investment in Nuclear Safety should provide significant safety improvements
  - Investment required in providing risk reductions measures should be commensurate with the safety benefit that will be obtained as a result of their implementation
  - Industry needs accepted tools to make the balance between investment for safety and safety improvement
Thank you for your attention