Öko-Institut e.V.
Institut für angewandte Ökologie
Institute for Applied Ecology

Organizational and management aspects in extended storage

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Our Profile

- Oeko-Institut is a European research and consultancy institute working for a sustainable future.
- Founded in 1977, non-profit association
- Offices in Freiburg, Darmstadt and Berlin, about 170 employees
- On the basis of interdisciplinary research, the institute
  - conducts research-based projects and studies,
  - develops key methodologies,
  - advises decision-makers in politics, industry and civil society,
- Clients: European Union, national and state-level ministries, companies, foundations and non-governmental organizations

Content

- Background Information
- Legal Requirements
- Overarching Aspects
- Organization
- Human Resources
- Knowledge Management
- Documentation
- Main Conclusions

figure: Öko-Institut e.V.

Background Information - Project

- Federal Ministry for the Environment (BMU) has initiated research programs for extended storage since 2007

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

- Contractors are GRS gGmbH, BAM, TÜV Nord and Öko-Institut e.V.

GRS

BAM Bundesanstalt für Materialforschung und -prüfung

TÜV NORD

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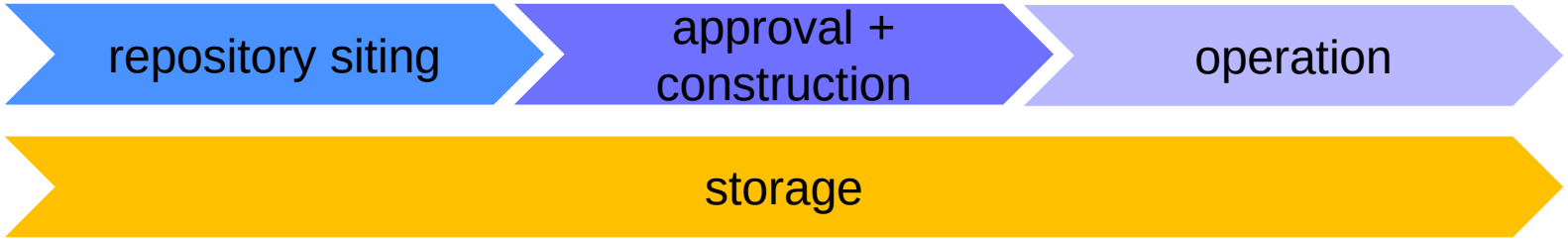
- Öko-Institut: (among other topics)
  organizational and management aspects
  focusing on the German situation, comparing with international examples

Background Information

- Storage facilities for spent fuel and HLW were licensed for 40 years.
- Storage time will be extended by the repository siting process.



- Extending storage → impact on management and organization;
  risks concerning safety: staff fluctuation or retirement, loss of expertise, documentation not available or not readable, …
- Organizational aspects are addressed in the management system for safety of the respective storage facility
  organization, human resources, knowledge management, documentation

figure: Öko-Institut e.V.

Legal Requirements

- Atomic Energy Act §7c (2) / §9h – Installation of a management system with safety priority
- Atomic Energy Act §19a / §9h – Periodic Safety Review, Improvement of nuclear safety
- ESK – Recommendations of the Nuclear Waste Management Commission:
  - "Guidelines for dry cask storage of spent fuel and heat-generating waste" (2013)
  - "Guidelines for the performance of periodic safety reviews and on technical ageing management for storage facilities for spent fuel and heat-generating radioactive waste" (2014)

Overarching Aspects

- Act on Reorganization of Nuclear Waste Responsibilities, 2017 -

  regulates the transition of responsibility (and financing) for waste management from waste producer to public-owned operator BGZ (Gesellschaft für Zwischenlagerung – company for storage)

  - transition of NPP sited SF storages to BGZ: January 1, 2019
  - consequence: organizational and management impacts on every storage facility
  - transition of human resources and knowledge to BGZ
  - Goal: “competence center” for storage

Overarching Aspects

- Because NPPs will be decommissioned, storage facilities at NPP sites will be self-sufficiently operated until final disposal (autarkization).
  - consequence: technical and organizational impacts to NPP sited storages
  - implementation takes place by BGZ → interdependencies between NPP operator and BGZ
  - Requirement of ESK Guideline: Development of an appropriate concept for every facility – so far there is no

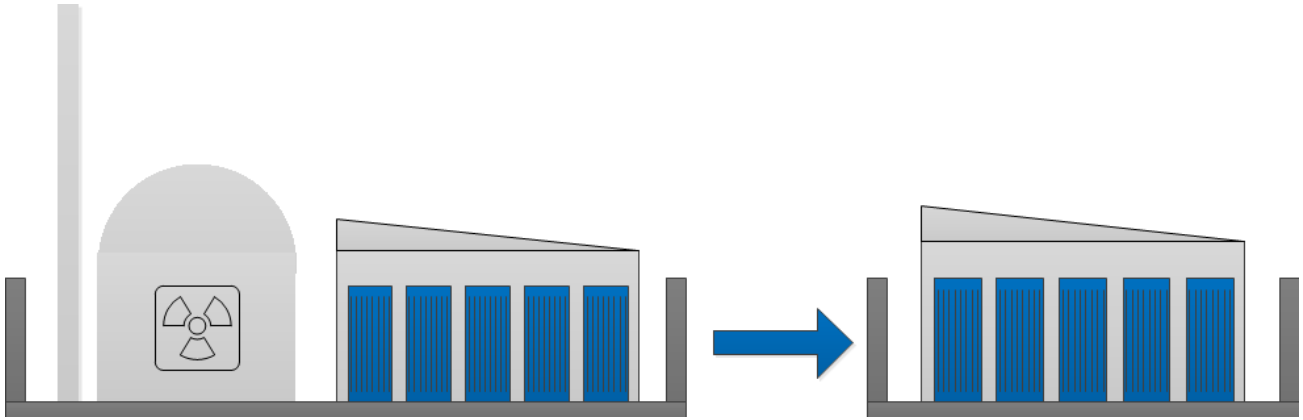


figure: Öko-Institut e.V.

[Aspect] (how to read the next slides)

[Description of what is meant]

Challenges

- [focused on the situation in Germany]

Examples

- [intenational or national examples for good practice]

Conclusions and Suggestions

- [also focused on the German situation]

Organization (1/2)

… means clear responsibilities and competences in the facility at all times

Challenges

- BGZ: concentration of capabilities and experience is an advantage for knowledge, experience exchange and redundancy of skills
- but needs a strong supervisory authority → balanced system of checks and balances
  - at present this task is divided into different “Länder” Authorities

Examples

- IAEA GSR Part. 2 (2016): Management and leadership are responsible for safety

Organization (2/2)

- Swiss authority ENSI: “Oversight of Safety Culture in Nuclear Installations”, a process started as a consequence of Fukushima accident; measures for self-reflection of the safety culture of the operator; dealing with one's own safety culture (within the authority)

Conclusions and Suggestions

- Periodic Safety Review (PSR) every 10 years could focus on organization and management.
- Strengthening supervisory authority e.g. by concentrating on a few authorities

Human Resources (1/2)

… means availability, recruitment and developing of personnel for the long tem

Challenges

- no requirements for long-term personnel planning in storage facilities
- Attractiveness of the task “long term storage” for potential employees? Maintaining competence in the field of radioactive waste management (ESK Memorandum)

Examples

- Canadian Nuclear Safety Commission (CNSC) developed a workforce profile for until 2025, measures include supporting talent in the existing workforce, recruitment campaign hiring ~50 science and engineering graduates, training plans, monitoring the retention of employees

Human Resources (2/2)

- KTA 1402 “Integrated Management Systems for the Safe Operation of Nuclear Power Plants” has requirements for personnel development planning in NPPs

Conclusions and Suggestions

- Personnel planning should be mandatory and verifiable for BGZ but also for authorities
- BGZ as a major operator could be a more attractive employer (many facilities, different tasks) than an operator for a single storage
- BGZ claims to be a “competence center”; consequences should also be:
  - national and international experience exchange
  - own research and development

Knowledge Management (1/2)

… means maintaining know-how, meta-knowledge, capabilities and skills

Challenges

- Knowledge (also meta knowledge) maintanance is necassary over decades
  (Operation data, information of cask loading, aging effects during storage time, …)
- Change of operator, retirement and turnover, etc.
- Relevant task also for authorities and expert organisations

Examples

- internationally is an important topic (OECD/NEA, JC reports, IAEA)
- U.S. NRC Knowledge Management Program: innovative infrastructure, communities of practice, capture of operating experience, recapture knowledge from former employees

Knowledge Management (2/2)

- Sharing knowledge embed as a value – (US Harrisburg University)
- Resources necessary

Conclusions and suggestions

- Implement inspections of the effectiveness of the operator's knowledge management – e.g. within the Periodic Safety Review
- Knowledge Management measures should be established in authorities; expert organisations should be involved

Documentation (1/2)

… means to preserve the entire content and also to guarantee long-term physical availability.

Challenges

- responsible for documentation in the present (ESK, KTA 1404): operators (NPP operators → BGZ)
- long-term responsibility (Site Selection Act § 38): Federal Office for the Safety of Radioactive Waste Management (BfE) – ordinance is foreseen!
- Interface: operator → licensing authority BfE?
- Documentation of supervisory authorities?

Documentation (2/2)

Examples

- KTA 1404 (refers to nuclear power plants): requirements for content, second copy, archiving location and inspections
- internationally: long-term documentation is a topic related to disposal
- OECD/NEA RepMet (Radioactive Waste Repository Metadata Management) Initiative deals with documentation of Metadata

Conclusions and Suggestions

- The planned German Ordinance should be developed and also address inspections (content and availability) and necassary resources (not in § 38)
- Existing guidelines (KTA 1404) and inspection measures can be integrated

Main Conclusions

- Knowledge Management should be applied at authorities.
  The long-term preservation of expert organisation knowledge should be clarified.
- Strengthening PSR as an inspection tool for organizational and management topics
- BGZ as a strong operator (“competence center”) needs a strong supervision authority/authorities – balanced system of checks and balances

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Thank you for your attention!

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