IAEA Safety Standards Regarding Disposal

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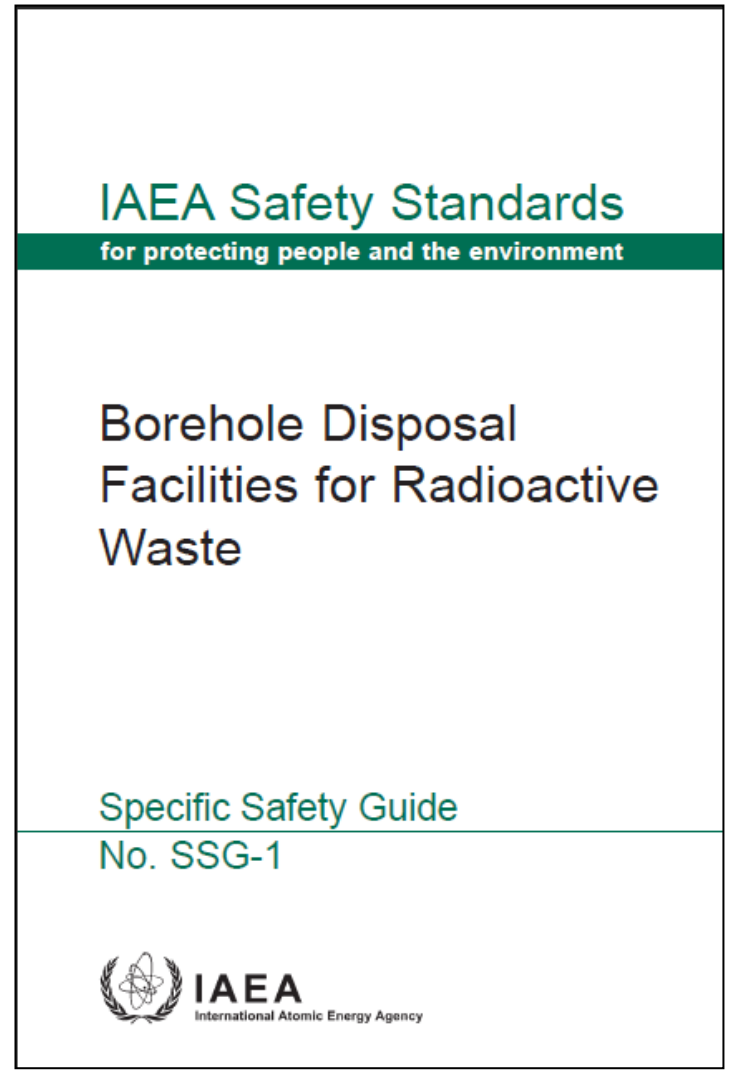
Structure of the IAEA Safety Standard Series SSG-1

- Introduction
- Borehole Disposal and the Safety of Radioactive Waste Management
- Borehole Disposal and the Protection of Human Health and the Environment
- Safety in the Planning of a New Borehole Disposal Facilities
- Safety and Disposal in New Borehole Disposal Facilities
- Implementation of the Safety Strategy for Existing Borehole Disposal Facilities
- Appendixes



1. Introduction

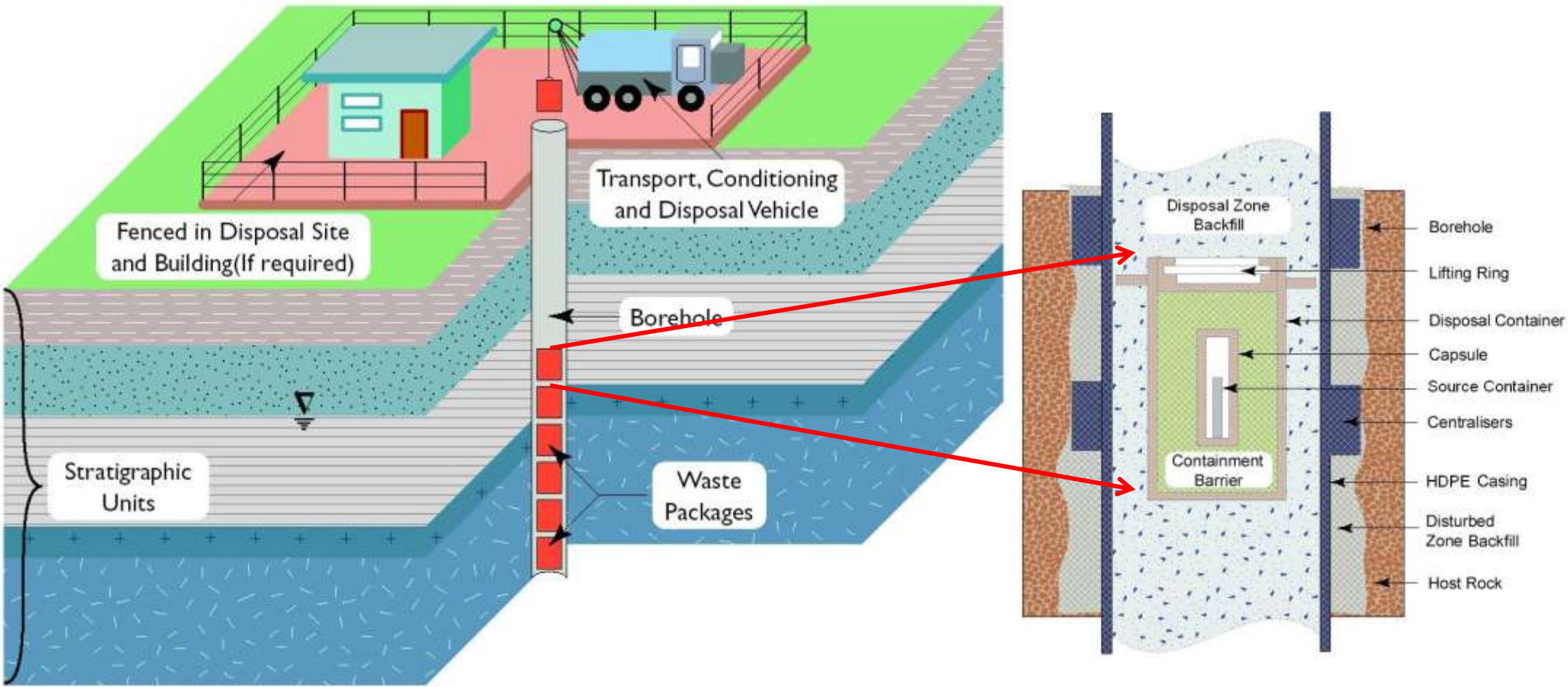
- Objective
  - Provide guidance on the design, construction, operation and closure of borehole disposal facilities for the disposal of radioactive waste in accordance with the relevant safety requirements (new and reassessing the safety of existing facilities)
  - Ensure compliance with safety requirements for the protection of human health and the environment
  - Intended to support a practical and systematic approach to decision making for borehole disposal such as would be required within the framework of a management system that provides for the necessary level of quality assurance and control

1. Introduction

- Scope
  - Focus is on boreholes with a diameter of no more than a few hundred millimetres and a depth beyond a few tens of metres and up to a few hundred metres
  - Concentrates on disused sealed sources & small volumes of low and intermediate level waste
    - Too long lived for decay storage (e.g. a half-life greater than a few years)
    - Too long lived and/or too radioactive to be placed in a near surface facility
    - Small volume waste for which no other disposal facility is available
  - Consideration is given to operational safety, the security of the waste and the achievement of post-closure safety (part of broader context)

2. Borehole Disposal and the Safety of Radioactive Waste Management

- Borehole Disposal Concept



2. Borehole Disposal and the Safety of Radioactive Waste Management

- Applying the Safety Principles In Radioactive Waste Management
  - Consistent with IAEA Fundamental Safety Principles
  - Given depth and waste characteristics, SG needs to be consistent with safety requirements for both geological disposal and near surface disposal
  - Graded application of near-surface and geological disposal safety requirements
  - Reasonable assurance of safety should be demonstrated to the regulatory body and to other stakeholders

3. Borehole Disposal and the Protection of Human Health and the Environment

- Radiation protection during the operational period
- Radiation protection during the post-closure period
- Environmental and non-radiological concerns
  - SG exclude considerations normally part of the EIA process
  - Protection of the environment
  - Non-radiological components of the borehole concept (sources and waste packages)

4. Safety in the Planning of a New Borehole Disposal Facilities

- Organizational predisposal activities to deliver the required operational and post-closure safety
- Legal and Organizational Framework
  - Government responsibilities
  - Responsibilities of the regulatory body
  - Operator responsibilities
  - Responsibilities of the generator of the radioactive waste

4. Safety in the Planning of a New Borehole Disposal Facilities

- Safety approach
  - Passive safety
  - Adequate understanding of, and confidence in, safety
  - Optimization of protection
- Safety design principles
  - Containment and isolation
  - Multiple safety functions (multiple barriers)
- Security of DSRS during operational and post-closure period

5. Safety and Disposal in New Borehole Disposal Facilities

- Framework for disposal
  - Step by step development and evaluation
  - Iterative evaluations of the design and management options, system performance and overall safety
- Safety case and safety assessment
  - Development of the safety case and safety assessment
  - Generic safety assessment
  - Site specific safety assessment
  - Independent review and assessment

5. Safety and Disposal in New Borehole Disposal Facilities

- Development of the borehole disposal facilities
  - Design of the disposal facility
    - General design considerations (e.g. choice of design, disposal environment)
    - Choice of engineered barriers
  - Site selection
    - Site characteristics
    - Initial approach to site selection
  - Site characterization
  - Construction and implementation of the borehole disposal facility

5. Safety and Disposal in New Borehole Disposal Facilities

- Development of the borehole disposal facilities
  - Operation of the borehole disposal facility
    - Radiological protection programme
    - Recruitment and training of personnel
    - Commissioning
    - Written procedures
    - Emplacement strategy
    - Backfilling boreholes
    - Sealing of boreholes
    - Inspection and review
    - Records

5. Safety and Disposal in New Borehole Disposal Facilities

- Development of the borehole disposal facilities
  - Waste acceptance criteria
  - Decommissioning of buildings and closure of the disposal facility
  - Post-closure institutional controls
  - Surveillance and monitoring programmes
  - Accounting and control systems for nuclear material
  - Management systems

6. Implementation of the Safety Strategy for Existing Borehole Disposal Facilities

- Past practices in borehole disposal from a regulatory perspective
- Safety reassessment for an existing waste disposal facility
- Intervention should be based on justification and optimization
  - Option 1: Carrying out additional site studies and applying justified corrective actions
  - Option 2: Retrieving the waste
  - Option 3: Accepting possible risks associated with the existing situation

Appendixes

- Regulatory inspection plan for a borehole disposal facility: items that may be subject to inspection
- The step by step approach
- Safety case and safety assessment for borehole disposal facilities
  - Preparation of the safety case and safety assessments
  - Documentation of the safety case and safety assessments
- Site characteristics and characterization of the hydrogeological properties of a site

Appendixes

- A possible surveillance and monitoring programme suitable for a small scale borehole disposal facility
  - Pre-operational (baseline) surveillance and monitoring
  - Surveillance and monitoring during the operational period
  - Surveillance during the post-closure period of institutional control
- Management systems
  - Setting up a management system
  - Working documents
  - Documentation

Thank You for Your Attention!